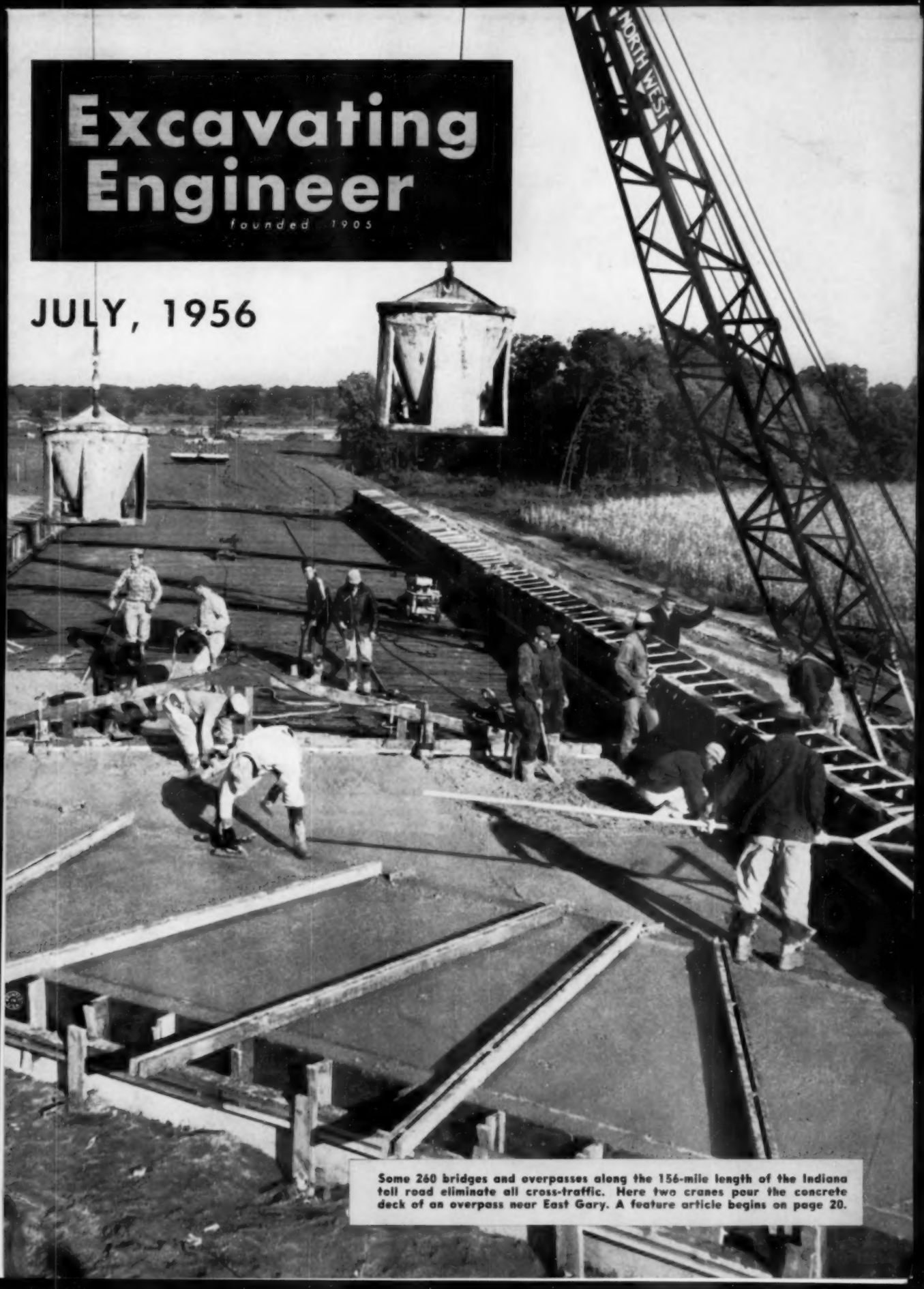
Excavating Engineer

founded 1905

JULY, 1956



Some 260 bridges and overpasses along the 156-mile length of the Indiana toll road eliminate all cross-traffic. Here two cranes pour the concrete deck of an overpass near East Gary. A feature article begins on page 20.

Those Who Use Them . . . Choose Them Again

BUCYRUS ERIE ROTARY BLAST HOLE DRILLS

In December, 1952, the Maumee Collieries Co., Terre Haute, Indiana, put the first Bucyrus-Erie 50-R into operation. So outstanding were the footage records of this drill that the company has since added three more.

All over the country the story is the same — those who buy one Bucyrus-Erie rotary soon want to convert completely to these moneymakers. Here are just a few of the many reasons why:

- Hydraulically-powered down pressure on the bit provides maximum controlled penetration.
- Ward Leonard electric control on rotation of the drill stem permits drilling at the most efficient speed for a given formation.
- Hole can be drilled continuously for the full length of a drill pipe. (32 ft. 9 in. for the 50-R; 27 ft. 9 in. for the 40-R)
- A remote-controlled, power-driven drill pipe rack adds or removes drill pipe without manual effort. Rack also stores pipe not in use.

36B56C

BUCYRUS-ERIE rotaries are available in two sizes — the 40-R (equipped with either diesel-electric or full electric power) for drilling 6¾- to 9-in. holes, and the 50-R (electric only) for drilling 9⅞- to 12¼-in. holes. For the complete story on these drills, write today to —

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Set your sights on an Allis-Chalmers HD-6G

"ALLIS-CHALMERS HAS A GREAT TRACTOR HERE... we like our HD-6G for its low cost, big output, easy transport and simple operation"

Joe Brown, Ratliff City, Oklahoma

Working on all kinds of jobs, large and small . . . keeping 9 trucks and 5 Allis-Chalmers tractor shovels busy, that's the Joe Brown Company. Read what owner Joe Brown says about his new Allis-Chalmers 1½-yd HD-6G:

"Working with two trucks on a recent road job, our 6G moved 700 yards of big rock in one day. In dirt it does even better. The tracks are heavy and long, and power is well coordinated with the bucket. All this means real economy to us; we're profiting with the 6G."

Kenneth Chromieter, HD-6G operator, says: "I like the visibility; and the engine is terrific." And speaking of bucket capacity and strength, Chromieter added, "You know, we had rocks in this bucket they wouldn't let me dump on the trucks. It sure can do the job."

• • •

Yes, the HD-6G "sure can do the job." Stories like this from owners and operators are coming in from all over the country to prove it.

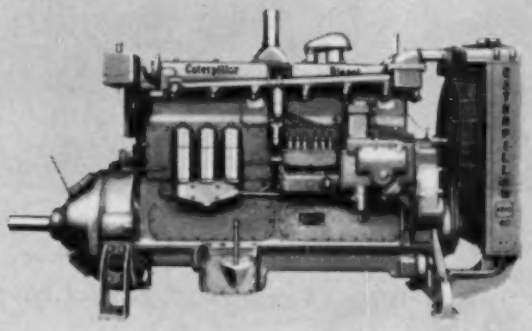
Let your Allis-Chalmers construction machinery dealer demonstrate the 6G for you . . . show you all the exclusive advantages that will help you get top performance and big production on *your* jobs.

HD-6G
1½-yd bucket
55 belt hp
19,600 lb

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

DEPENDABLE CATERPILLAR POWER HELPS CHANGE NIAGARA'S COURSE



Caterpillar-powered equipment is helping slow Niagara's famous Bridal Veil Falls to a temporary trickle. This CAT*-powered Koehring crane is swinging two men with sandbags to build a diversion dam in the Niagara River. Walter S. Johnson Building Co., Inc., of Niagara Falls, N. Y., is building a total of three dams. The objective is to direct the river flow away from two islands, which are badly water-eroded, so that overhanging precipices can be cut away.

"We've been in business 33 years," says Jack B. Johnson, vice president, "and when we discovered Cat quality, we stayed Caterpillar owners. They're dependable, durable machines." The Johnson company is 100% Caterpillar equipped. They have a D315 in another Koehring plus four Caterpillar track-type Tractors, in addition to the D13000 in this rig.

The D13000's reputation as a tough, long-wearing engine is now being carried on by its new modern version, the D342, which develops even more horsepower from the same size engine. The D342 is only one of the new models in the Caterpillar line of modern Diesel Engines, now available with maximum output capacities up to 650 HP.

All these new power plants share the advantages of Caterpillar's sturdy four-cycle construction. There's no need to clean air boxes or cylinder ports, or to tinker with fuel injection adjustments. These dependable yellow engines have such long-life features as "Hi-Electro" hardened crankshafts, special aluminum alloy bearings, and highly effective oil, air and fuel filters.

Your Caterpillar Dealer will tell you about the Caterpillar Engine that can do most work at lowest cost for longest time on *your* job. See him when it's time to repower—and specify Caterpillar power when you order new excavating equipment from a leading manufacturer.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

MODERN HEAVY-DUTY POWER

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Excavating Engineer

founded 1905

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Opening of the $280 million northern Indiana toll road this year will complete an 830-mile, four-state chain of limited access superhighway between Chicago and New York City.

Strangest Rock in the Southwest—by Ray Day 30
Rock asphalt is nature's ready-made road material, but mines like White's Uvalde setup in south Texas show that it is hard to dig and handle because of peculiar, interesting tendencies.

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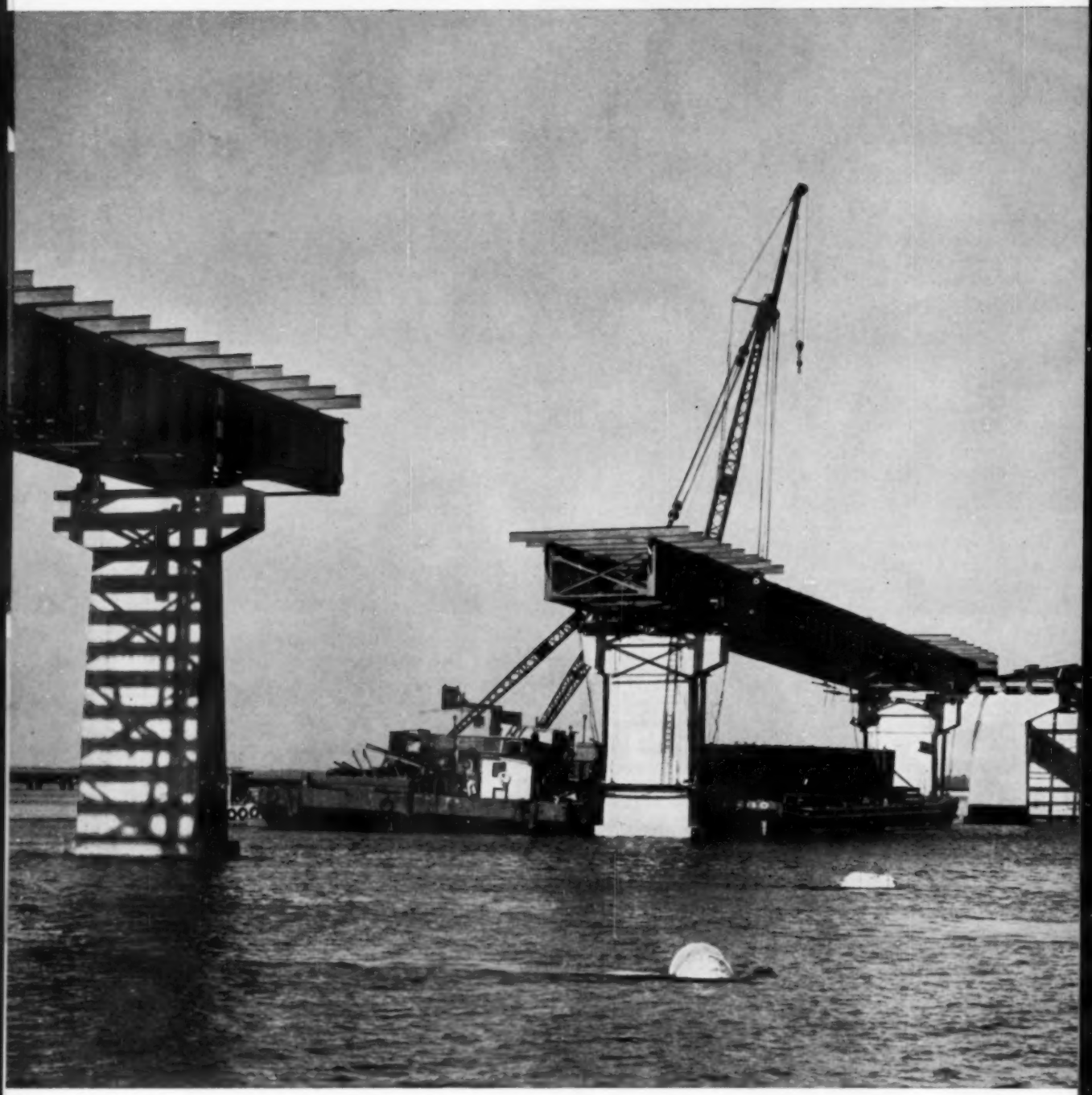


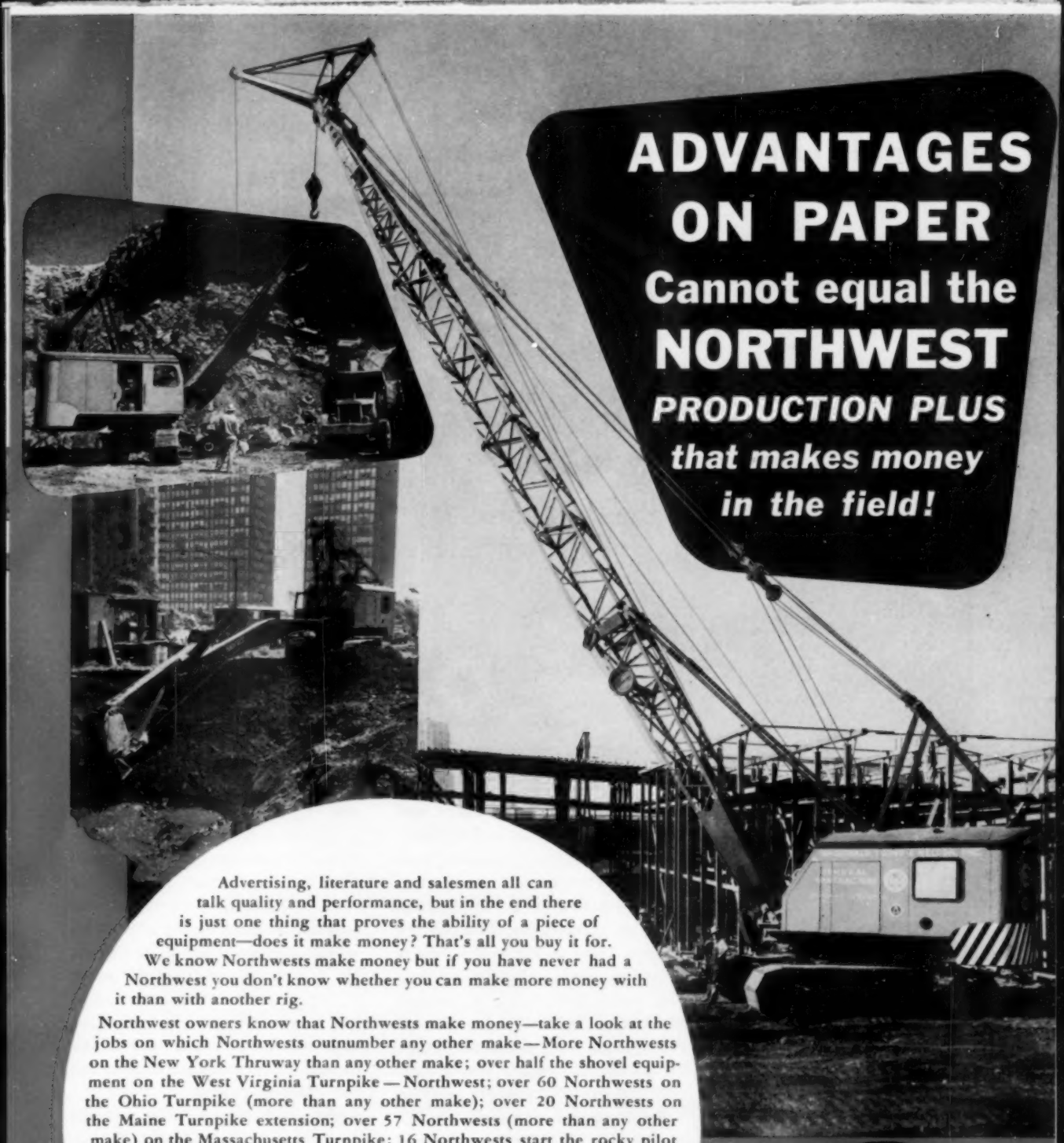
Wire Rope at Work—New Jersey's great Garden State Parkway has the incredible total of 282 bridges, and the photograph above shows the last of them nearing completion. It is the Great Egg Harbor Bay Bridge, an impressive span just west of Ocean City. The steelwork, more than a half-mile long, weighs some 2500 tons.

The picture was taken just after two 63-ton girders, completing a 180-ft span, had been erected. The derrick that did the hoisting was equipped with a 90-ft boom, a 43-ft mast, and Bethlehem Purple Strand wire rope. As always in lifts of this nature, a great responsibility rested upon the rope, but the sinewy Purple Strand was more than equal to the job. Taking the loads in stride, it made the dramatic lifts seem routine.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING



ADVANTAGES ON PAPER

Cannot equal the NORTHWEST

PRODUCTION PLUS that makes money in the field!

Advertising, literature and salesmen all can talk quality and performance, but in the end there is just one thing that proves the ability of a piece of equipment—does it make money? That's all you buy it for. We know Northwests make money but if you have never had a Northwest you don't know whether you can make more money with it than with another rig.

Northwest owners know that Northwests make money—take a look at the jobs on which Northwests outnumber any other make—More Northwests on the New York Thruway than any other make; over half the shovel equipment on the West Virginia Turnpike—Northwest; over 60 Northwests on the Ohio Turnpike (more than any other make); over 20 Northwests on the Maine Turnpike extension; over 57 Northwests (more than any other make) on the Massachusetts Turnpike; 16 Northwests start the rocky pilot work on the Kansas Turnpike; over 35 Northwests on the St. Lawrence Seaway—and we could go on and on. This plus the fact that one out of every three Northwests sold is a repeat order in the hands of a responsible contractor, demonstrates the *production plus* that Northwests give—service that means output and profit—service that *makes money in the field.*

NORTHWEST ENGINEERING COMPANY

1506 Field Building, 135 South La Salle Street, Chicago 3, Ill.

G80-1-1CG

PRODUCTION PLUS · $ · MEANS MONEY

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA

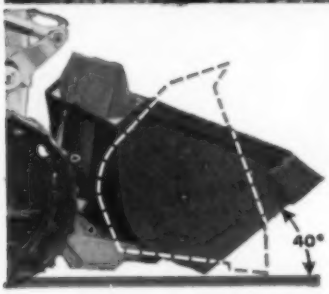
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

AMERICAN ROAD BUILDERS ASSOCIATION

NORTHWEST

NOW . . . a loader which combines crawler traction with rubber-tired speed . . . a loader with unmatched visibility plus perfect balance

the all new International® Rear-engine Payloader®



Tremendous pry-out force is obtained by using breakout pads on ground as fulcrum for leverage. Load forces transfer to ground instead of to machine.

40° bucket tip-back at ground level permits digging of bigger bucket loads, plus retaining of more of load in bucket during lifting and carrying.

For *speed, maneuverability,* and *big capacity* in a crawler-loader, see the new International 1¼ yard Model 12 Payloader!

This amazing 77 net hp machine seats its operator *in front of the engine,* close to the bucket, where he can always see what he's loading, and where he's going. It balances the tractor between rear-mounted engine and front-mounted bucket. It distributes weight evenly over entire length of tracks, to give you better traction, longer track life, better stability on grades, less bogging down in spongy ground.

Your operator moves faster on the new Payloader, too. He can go up to *10 mph forward, 13 mph reverse.* He changes speeds or *direction* rapidly through a full-power shift, three-speed, full reversing transmission. He need hardly slow down or reduce engine power to shift gears. He gets maximum digging power from the machine's torque converter. And he steers easily, too, controlling each steering clutch and brake through one power-boosted *lever* (no foot steering brakes).

Try this new International Model 12 Payloader for yourself. Let us arrange a demonstration. Call soon! A good deal awaits you!

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

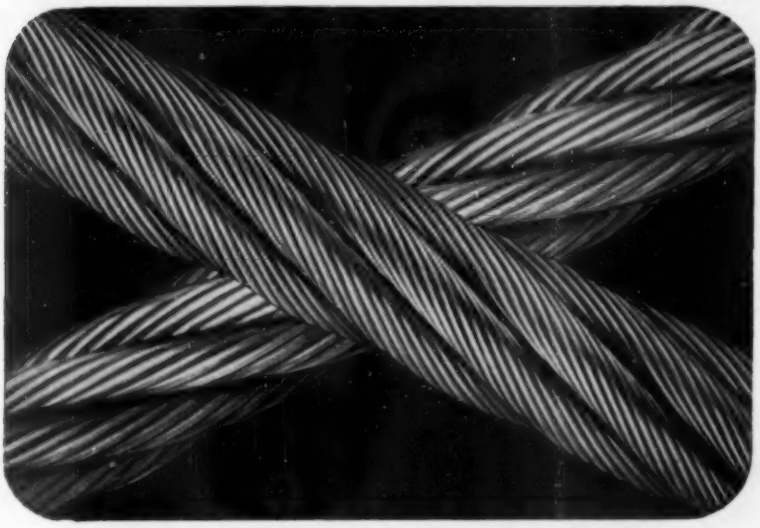
INTERNATIONAL HARVESTER

International® Construction Equipment

International Harvester Company, 180 North Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks.

FIRST WE DEVELOPED 1105 ROPE WIRE.



THEN WE MADE ROEBLING'S

Royal Blue

WIRE 1105 ROPE

1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

Contact your Roebling distributor or write us for the full story.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 81 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. ODESSA, TEXAS, 1930 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1723 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N.Y.

Small job or Big project..

On this Florida Turnpike contract of Blythe Bros., two TS-18 "Eucs" loaded, hauled and dumped in sandy conditions that "hung up" other equipment. The tremendous power and traction of this Euclid scraper, and its easy operation, made the "Twin" a logical choice for this tough job.

Western Contracting Corp. owns 15 of these TS-18 Euclid Scrapers . . . they used 12 of them on a 7 million yard Indiana Turnpike contract and now have 10 of their "Twins" at work on Oahe Dam in South Dakota. Western's scrapers are equipped with top extensions that add 6½ yds. to the bowl capacity . . . have a total of 518 h.p.—a 300 h.p. engine in the tractor and 218 h.p. for the scraper wheels.

EUCLID TWIN-POWER in the TS-18 provides more work-ability than you get in any other scraper

Twin-Power—the use of two engines driving separate axles—was pioneered in the earth moving field by Euclid 10 years ago. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power matched to all job conditions. One of Euclid's newest scraper models, the TS-18 uses power and drive components that have proved their dependable performance in other "Eucs" on hundreds of jobs.

The TS-18 is powered by two 218 h.p. engines—one in the tractor and another behind the scraper bowl. For work where even more power can be used, a 300 h.p. engine for the tractor is available. Both engines drive through separate Torqmatic Drives. Standard tires are 27.00 x 33 with 33.50 x 33 available as optional equipment.

Harris Construction Co. recently set a new record for earth moving on Montana highway work with six TS-18 "Eucs". . . moved 90,000 yds. in a single week, working 10 hours a day. The scrapers self-loaded and hauled an average of 2,000 ft. This contractor is also using his "Twins" for grading and construction of runways at nearby Glasgow Air Base.

EUCLID DIVISION
GENERAL MOTORS CORPORATION
Cleveland 17, Ohio

this TS-18 "Euc" *cuts earth moving costs!*

VERSATILITY
for a wide range of work!

The TS-18 is the most recent development of the Twin-Power principle pioneered by Euclid and job proved in earlier scraper models. Its unequalled power and traction gets more work done . . . sets a new standard for low cost scraper yardage. Self-loading in practically any material from loose sand to hard shale, the TS-18 is a one-man earthmoving spread. It works on steep grades and under job conditions that stymie other self-powered scraper equipment.

Hydraulic lever action does away with cable headaches and expense. All scraper operations—bowl, apron and ejector—are independently controlled. All four of the hydraulic jacks are interchangeable . . . one spare fits anywhere. The low, wide bowl design and reversible four-section cutting blade make the TS-18 easy to load . . . heaped loads up to 24 yds. are picked up fast.

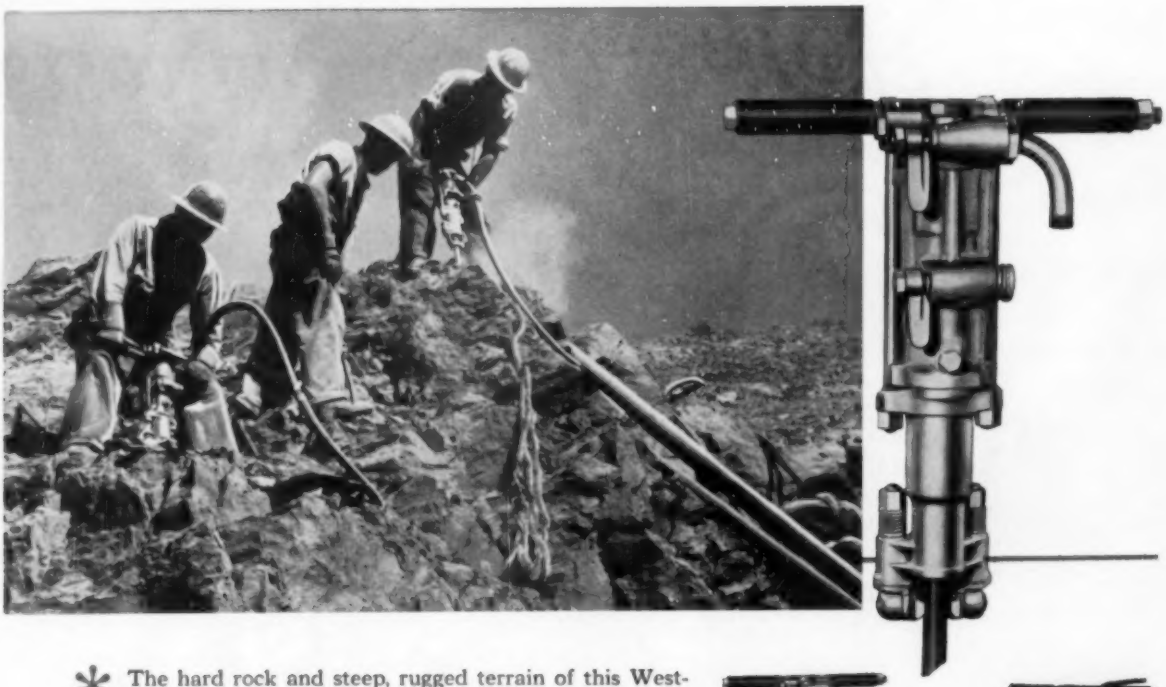
Like all other Euclid Scrapers, the TS-18 is built to stay on the job with less down-time for servicing and repair. All major components are readily accessible . . . a feature that really pays off in more work-ability and lower maintenance cost. Your Euclid dealer has facts and figures showing why owners everywhere say that ***Euclids are your best investment.***

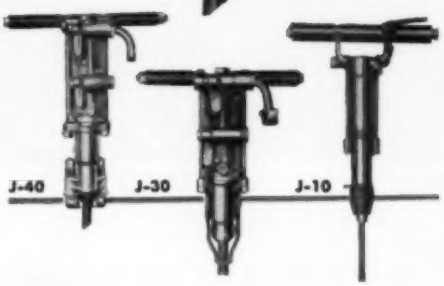
Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM MORE POWER FOR YOU

here's another tough job* that only a JACKHAMER could do so well





* The hard rock and steep, rugged terrain of this Western dam site called for a powerful yet easy handling Jackhamer. The Ingersoll-Rand J-50 was selected because its combination of weight, power and balance proved just *right* for this heavy-duty drilling operation.

There's a hard-hitting Ingersoll-Rand Jackhamer of the right weight and power for *every* hand held rock drilling application. Choose the one that's best fitted to your job requirements and you're sure to get highest overall drilling speed – plus the proved *dependability* for which the Jackhamer has become so widely known. Put this power-packed member of the Ingersoll-Rand Contractors' Combination to work with Carset Jackbits on your next project. You'll find complete data on the entire line in Bulletin No. 4096A. Your I-R dealer or branch office will be glad to send you a copy.

CONTRACTORS' COMBINATION
offers a
hard hitting JACKHAMER
that's right for
any type of work

Ingersoll-Rand
11 Broadway, New York 4, N. Y.

5-65

ROCK DRILLS • COMPRESSORS • AIR TOOLS • TURBO BLOWERS • CONDENSERS • CENTRIFUGAL PUMPS • OIL & GAS ENGINES

Now...

with 416 HP and 4-wheel drive

world's MOST POWERFUL and FASTEST push tractor...

The Twin-C Pusher

...to give you bigger loads in shorter loading time

One operator and this powerful "Twin-C" pushes your biggest production scrapers for capacity yardage. On many jobs it will do this in less time than it takes 2 crawler-pushers with 2 operators. Rubber-tired speed, and articulated steer, give quick maneuverability for direct-line push, save seconds in picking up next load.

Synchronized power matches speeds of earthmovers — Twin-C speeds match loading speeds of modern rubber-tired earthmovers, take advantage of combined power of loader and pusher to get big pay loads *fast*. Torque converter, teamed with constant-mesh transmission in both front and rear engines, reduce "lug downs" and gear changes necessary in many pushers.

More usable power with rubber pushing rubber — You get greater usable horsepower and coordinated pushing force when you push rubber with rubber. You get full floating traction... tire treads follow tire treads... no loss of power to flatten out rounded tire-tracks into flat track-tracks. And Twin-C's 80,000 lbs. weight rides on four big 29.5 x 29 tires with 22-ply rating; each 2'5" wide for firm ground-gripping traction on any type of surface.

Additional Twin-C advantages:

- Forward speeds to 20 mph and fast reverse, plus "articulated" steer, enable Twin C to position faster behind scrapers.
- Big 49½ x 88" heavy, concave push-bowl is positioned by an electric motor to take full advantage of contact area provided by scraper push-block.
- Push-button electric controls with instant response, the same type controls used on LeTourneau-Westinghouse scrapers for 8 years, give you positive power-steer and accurate push-plate-positioning.
- Power-transfer differentials on both engines match pull to traction, automatically apply power to wheels on firmest footing. Keep big pay-loads rolling in sand, mud, and loose materials.

If your fleet includes production scrapers, you will want more information on the Twin-C Pusher. Ask your LeTourneau-Westinghouse Distributor for full details.

65,900 lbs. Drawbar Pull! Powerful 416 hp Twin-C Pusher push-loads scraper fast. In recent Dynamometer tests, Twin-C, operating in sandy clay footing, registered drawbar pull of 65,900 lbs. in low-speed range.

Twin-C—Trademark TW-1039-G-b

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

when buying buckets...

consider these *Hendrix* features

LIGHTER BUCKET WEIGHT . . . providing greater capacity without sacrifice of strength or durability.

ALL-WELDED CONSTRUCTION . . . including arch of box-section design and one-piece hitch plate and hoist trunnion casting for structural strength and distribution of drag pull.

14% MANGANESE STEEL . . . chains, all other fittings, reversible tooth points and armor.

PERFECT PERFORMANCE . . . easier handling . . . faster loading . . . cleaner, smoother dumping.

A TYPE FOR EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

Hendrix *Dragline Buckets*

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

"GREAT" for all-around utility work

says Supt. on Garden State Parkway contract

On their 14 mile section of the Garden State Parkway in Cape May County, New Jersey, Public Constructors, Inc., Pleasantville, are using a 19 mph rubber-tired Tournatractor for all-around utility work.

This 208 hp tractor works all over their widely-scattered 2¼ million-yard sand job. It often moves ahead of the company's 33 scrapers to clear trees and brush and handle pioneer dozing. At times, it is used to level cuts and fills and to doze around bridges and culverts. Because of its speed and maneuverability, tractor-on-rubber performs these utility assignments without interfering with production dirtmoving.

Besides leveling work, Tournatractor is also used to push-load some of the contractors' 11 C Tournapulls. Where material is pure white sand, tractor's fast pusher-service loads the 16-yd. "C's" in as little as 45 seconds.

Used for other scattered jobs

Tournatractor is always ready for emergency calls, too. Jobs 5 miles away can be reached in 20 minutes (or less) due to its 19 mph speed. Cleaning haul roads and dozing fill on distant sections of the job are handled quickly and efficiently. Paved highways present no travel problems for the tractor-on-rubber. It goes everywhere under its own power . . . needs no blocking, planking, trailer-loading and unloading. For all around utility service, it "gives a great performance day after day," says Supt. John Franks.

Discover for yourself why the fast, mobile Tournatractor is ideal for utility-type assignments, as well as major tractor work. Phone or write for a demonstration on your job, today. There's no obligation.

Tournatractor, Tournapull—Trademark Reg. U.S. Pat. Off. T-837-H-b

Tournatractor, with its 4-wheel drive, push-loads 16-yard C Tournapull in 45 to 60 seconds. Big low-pressure tires provide plenty of traction and flotation even in this poor, sandy footing.

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

The Whole Construction Story wrapped up in one Gigantic Package!

A.R.B.A. ROAD SHOW and CONVENTION

International Amphitheatre—Chicago

Almost 10 years since the last Road Show has seen vast changes —changing personnel in your organization—new people and expansion. Field operations cannot possibly permit the fullest study or comparison of equipment and the press of business reduces the opportunity for learning all there is to know of new methods.

The A. R. B. A. Road Show and Convention will bring you the whole construction story wrapped up in one package. 300,000 sq. ft. of equipment—over 1,000 pieces of machinery—down-to-earth discussions by leading construction authorities—a 6-day opportunity to "catch up" on all that's new in construction.

The tremendous immediate future of the industry warrants your planning to be there. Write for data on reservations. Ask to be put on the list for future information on the 1957 A. R. B. A. Road Show and Convention.

The 10 Best Reasons Why You Should Not Miss The A.R.B.A. Road Show and Convention

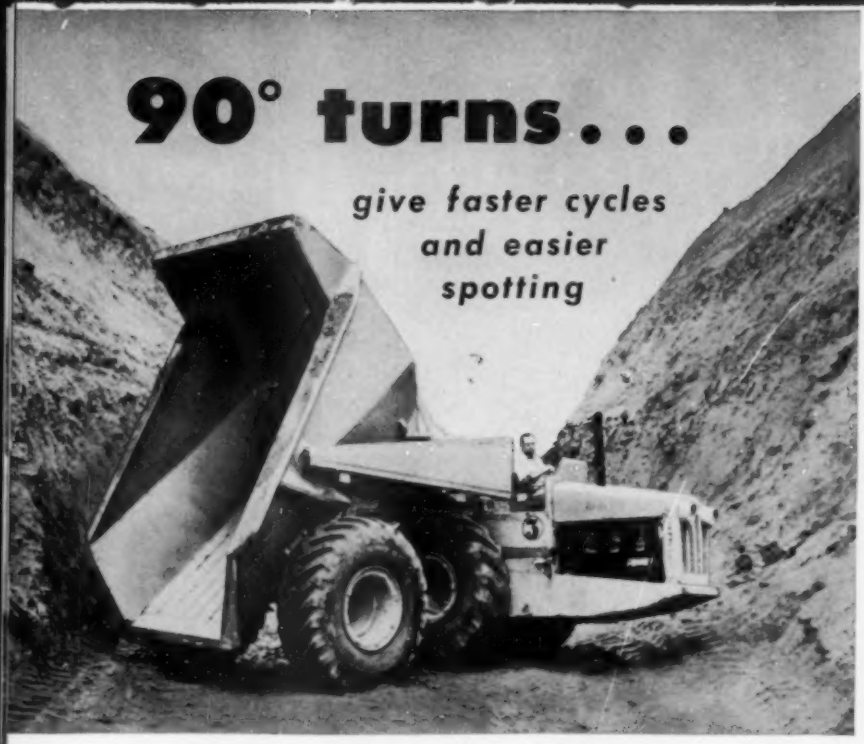
1. First Road Show in nearly 10 years!
2. The best way to "catch-up" on latest advancements in equipment, materials and methods.
3. Helps you determine best buys in machinery through first-hand comparisons.
4. Gives you information you need to improve your operating efficiency.
5. Hear top-ranking specialists in all phases of highway, street and maintenance work.
6. Learn how latest Federal Government plans and regulations will affect YOU.
7. Meet leading Federal, State, County and Municipal authorities.
8. Discuss equipment and service needs with manufacturers and distributors.
9. Swap ideas with construction and maintenance experts from all over the world.
10. Renew old contacts . . . make new friends.

AMERICAN ROAD BUILDERS' ASSOCIATION

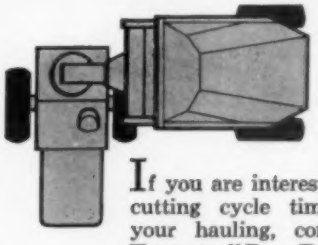
World Center Building Washington 6, D. C.

90° turns . . .

give faster cycles and easier spotting



Tournapull Rear-Dump's short-turn radius saved construction of expensive turn-arounds in this 26' wide, 165' deep railroad cut. With body raised, as shown, "C" easily made non-stop U-turns within the narrow area.



If you are interested in cutting cycle time on your hauling, consider Tournapull Rear-Dumps.

These units make a non-stop U-turn by power steer in less than their own length. They eliminate time normally wasted shuttling back and forth to turn in narrow quarters. They also frequently eliminate skid-plates or expense involved in construction of special turn-around areas.

Where space is unlimited, 90° turnability still gives you faster cycles. At the shovel, fast-maneuvering Tournapull Rear-Dump swings in and positions quickly. Loading unit need not sit idle while hauler operator wastes time on a wide sweeping turn and then a long, slow back-in. Quick, safe spotting saves additional time on the dump.

Simplicity reduces maintenance

A great deal of the expense involved in maintenance is also eliminated because of the simplicity of the Tournapull turn mechanism. Steering involves only an electric motor connected to a ring gear and king-pin shaft. A flick of the finger activates the motor and causes prime-mover to pivot up to 90° around trailing unit. Turns are made quickly regardless of footing. There are no front steering knuckles, no reach rods, no complicated mechanisms to get out of line, maintain, or repair.

Now available with optional tailgate.

Check these and all the other advantages of Tournapull Rear-Dumps. See for yourself how they speed cycles and cut costs. Write or call any time for owner-verified production studies and specifications. There's no obligation.

Model	Capacity	HP	Overall Length	Width req'd. for 180° turn	
				Travel position	Dump position
D	11 tons	138	24'10"	24'8"	18'8"
C	22 tons	208	29'9"	28'8"	20'8"
B	35 tons	293	35'10"	35'	27'

These features, too, can help on your job

Hauls anywhere — Big single low-pressure tires let Rear-Dumps safely travel narrow haul roads, paved highways, city streets . . . haul cross-country over roughest terrain, through muck and soft fills.

Reduces maintenance — Because these Rear-Dumps have no jack lines, no long drive-shaft, no frame, subframe, springs or tie rods, most common troubles of conventional rear-dump haulers are eliminated.

Dumps fast, clean — Flick of switch activates hoist motor. Body lifts quickly to any desired angle for spreading on run. At full dump position, bowl-lip is behind rear wheels so dump can be made clean over bank. Streamlined body sheds material readily.

Cuts weather delays — Power-transfer differential automatically applies power to drive wheel on firmest footing . . . pulls unit through mud, sand, soft materials which stop ordinary haulers. It's a Tournapull exclusive.

Resists body shock, damage — Three-layer, all-steel, grid-type bowl with tool-steel floor resists loading shocks. Big, wide bowl opening is easy target for any loading unit.

Improves safety — Multi-disc air brakes have more braking surface on one wheel than most haulers have on all 4. Low center of gravity, good visibility, front-wheel drive, easy control all contribute to maximum safety.

Delivers full power — Torque converter (optional in C size) automatically balances load and torque so you get full horsepower always. Lugging is reduced; shocks in transmission and final drive virtually eliminated.

Reduces fatigue — Big low-pressure tires and air-foam cushion seat smooth out ride for operator. Electric push-buttons control power steer and 2-way power dump. Eliminated is all manual work of fighting balky levers.

Insures future earnings — Behind Tournapull prime-mover, you can interchange rear-dump with scraper, bottom-dump, crane, flatbed. These trailing units lower your investment, let you handle any future job efficiently, help you keep your Tournapull profitably busy the year-around.

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Such results come not only from specially developed explosives and blasting supplies, but also by using the most modern blasting methods. Hercules' continuous research and extensive knowledge of field conditions are important to economical and efficient blasting in quarrying, coal mining, metal mining, and construction.

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XR53-9

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...says Excavating Contractor, E. A. LaChapelle

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"*ESCO* points do a much better job than the solid teeth they replaced. I get real operating economy in all types of hard-to-move material. The points break up the material as they bite into it, so the shovel comes away with a full load every time. The heavy-duty shank on an *ESCO* point adapter just doesn't break off. *ESCO* points make the tractor shovel a good tool for brush clearing, too."

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said C. B. Hewitt, President,
Hewitt Contracting Company, Columbus, Georgia

"...and that's why we standardized on *ESCO* Alloy 12 M Scraper Blades"

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Grading work on the east-west toll road traversing flat, sometimes rolling, northern Indiana is primarily a job for scrapers.

Last Link in America's Dream Road

CONTRACTORS along a 106-mile section of the east-west toll road across northern Indiana are making an all-out effort to beat fast-approaching contract deadlines. The easternmost 50 miles of the 156-mile long superhighway were scheduled for opening July 1. The remainder of the road west to Chicago is scheduled to be opened up in two stages this summer and fall.

Governor George N. Craig of Indiana and other state and national dignitaries are scheduled to participate in the formal dedication of the road near South Bend on September 17. The initial 50 miles from the Ohio border west to the Middlebury interchange at State Route 13 were to have been opened with little fanfare, but opening of the next 75-mile section through South Bend and thence west to Lake County on September 15 is expected to set the stage for the dedicatory ceremonies. Earthmoving and structural work in this area is practically complete and paving is now being laid.

A listing of Toll Road contractors is on page 63.

In Lake County, however, where construction was begun last and where problems are the toughest, major steel erection and concreting work and a small amount of grading remain to be done. This final 20-mile stretch is to be ready November 15.

Contractors in this area pushed work all through the cold of winter, when normal construction activity ceases, and through the mud and rain of spring. With bond interest on the quarter-billion dollar project amounting to $27,000 a day, the completion of the road is a race against time.

The rush to put the project on a paying basis is important not only to the Indiana toll road commission, for whom the road is being built, but also to officials of the turnpike author-

Opening of the $280 million northern Indiana toll road this year will complete an 830-mile, four-state chain of limited access superhighway between Chicago and New York City.

ity of neighboring Ohio. The Indiana facility is expected to help boost toll revenue of the $326 million Ohio turnpike, which, so far, has failed to meet income expectations.

Interstate trucking firms, especially, have been reluctant to use the pay-your-way Ohio route. Truck traffic coming off the turnpike has had no place to go except toll-free public highways in Steuben County that were unsuitable for heavy traffic. A traffic and earnings survey report prepared by Parsons, Brinckerhoff, Hall & MacDonald, New York consulting engineers firm, indicates that 2 million vehicles will use the Indiana toll road during its first full year of operation.

Turnpike Route

The route of the toll road, beginning at its connection with the Ohio turnpike near Metz in Steuben County, goes generally north of Angola, LaGrange, Elkhart, South Bend and LaPorte, south of Michigan City and Chesterton, and then through East Gary, Gary, East Chicago and Hammond to 106th Street and Indianapolis Boulevard—the Indiana-Illinois state line.

The Indiana road will provide the final link in a non-stop Chicago-New

A Northwest 80-D crane owned by Arcole-Midwest Corp. pours concrete supplied by a Koehring 34-E Twin Batch paver into a tarpaulin-protected form. The job is C-29.

A 5-yd. Manitowoc 4500 dragline excavates peat along the Calumet River. A dredge in background places hydraulic roadway fill.

A Marion 372 crane owned by Bates & Rogers Const. Corp. places structural concrete at Gary interchange, one of 12 on road.

York turnpike network. After crossing Indiana's seven northernmost counties on the Hoosier toll road, motorists will speed over the 241-mile Ohio turnpike and then across Pennsylvania's 359-mile turnpike. Joining the Pennsylvania and New Jersey turnpikes is a newly completed high-level bridge across the Delaware River. Once on the Jersey turnpike, travelers and truckers will breeze right up to one of the vehicular ports of entry to the city of New York—the Lincoln or Holland tunnels, or the George Washington Bridge.

Rigged with a 1½-yd. clam, the same crane digs pier footings as a 4,000-gpm Griffin wellpoint system dewaters the excavation. Bates & Rogers holds a pair of contracts.

During the entire 830-mile distance, drivers won't encounter a single stoplight, sharp curve, steep hill, rail crossing or highway intersection at grade level. By paying their way, motorists will save an estimated nine hours driving time compared to what the trip would be over public roads, and at the same time save a lot of wear and tear on their vehicles and nerves.

By way of comparison, if a motorist traveled across Indiana on a good toll-free road likes U. S. Route 20, he would be slowed down or halted by 74 stoplights, 18 rail crossings, one drawbridge, 15 school zones and 20 major highway intersections. Speed limits of 40 mph or less would be enforced for about one-third of the way.

To avoid all this harassment, a traveler will pay less than two dollars for a passenger car trip one-way across the state. Toll road traffic will move at speeds up to 65 mph with stops necessary only at state lines to pay tolls.

The Indiana toll road is an important part of an ambitious plan of public harbor and toll highway development proposed during 1955 by Governor Craig. The governor's "blueprint for a greater Indiana" includes the following projects:

Construction of a "Port of Indiana"

harbor on the south shore of Lake Michigan to provide facilities for ocean traffic which will enter the Great Lakes when the St. Lawrence Seaway is completed in 1959.

Construction of a north-south toll road between the Chicago area and Indianapolis, and then south to either Louisville, Ky., or Cincinnati, Ohio, or both points.

Construction of an east-west toll road in southern Indiana as part of a tri-state Cincinnati to St. Louis tollway.

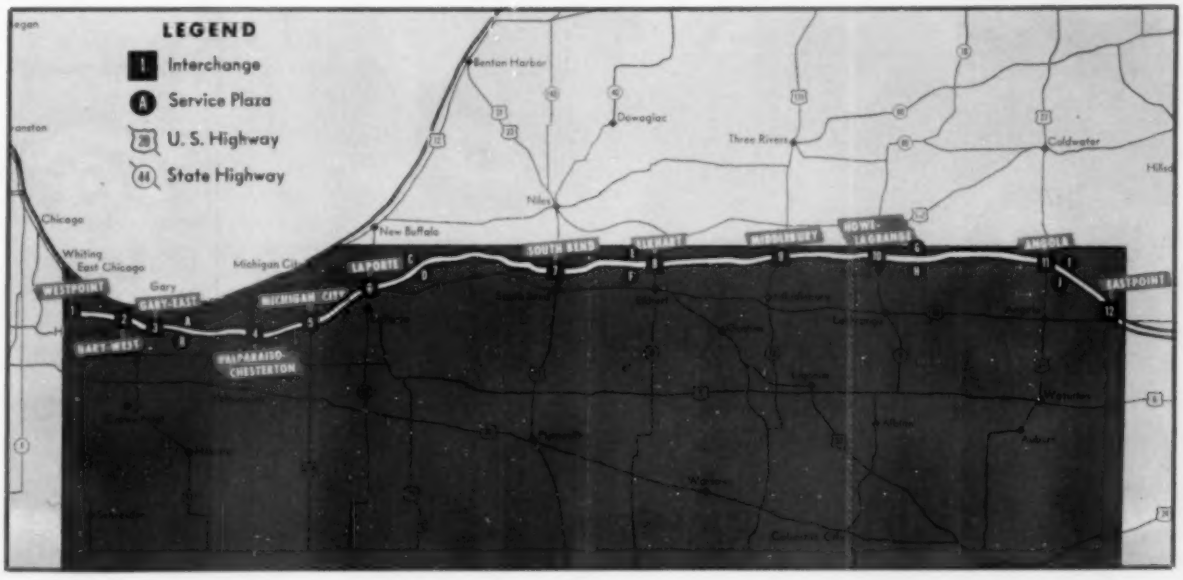
The governor's program suggests that this network of toll roads would carry incoming ocean cargo to the east, south and west, making Indiana the "transportation crossroads of America."

Complex Engineering Problem

Construction of the Indiana road has presented a massive, complex engineering problem to the J. E. Greiner Co., Baltimore, Md., consultants to the toll road commission, and eleven contracting engineering firms. One reason for this has been the rigid safety standards incorporated into the road's design. Another is the fact that the road traverses a lot of unstable muck and marshland, weaves through the network of lakes that dot Steuben and Lake counties, and passes through the heart of the dense industrial region south of Lake Michigan.

Toll road commissioners and the designers of the project take great pride in the high standards to which the road is being contructed. It has 13 built-in safety features to speed traffic and pro-

Much of the toll road in Lake County is elevated. A crew of Union Building & Const. Corp. prepares bolt connections for steel spans. Lima piledriver is in background.



tect the lives of motorists and commercial truckers. Here is a brief rundown on them:

1. Elimination of all traffic signals and grade level crossings with a series of 260 bridges, overpasses and underpasses.

2. A heavy duty 10-in. reinforced concrete pavement comparing with conventional 7 to 9-in. pavement.

3. Paved blacktop shoulders—10-ft. wide on the right side and 8-ft. wide on the left side of both traffic lanes.

4. A gradual curve at least every two miles to prevent monotonous driving and driver drowsiness.

5. A 56-ft. median dividing strip between the dual lanes to prevent or lessen head-on collisions and reduce headlight glare.

6. No left turns.

7. A maximum upgrade of 2% and a minimum downgrade of 4% to eliminate steep hills.

8. A minimum sight distance of 900 feet.

Western Contracting Corp. used 10 new Euclid twin-engined TS-18 scrapers on its 28-mile contract, longest on toll road.

A Bucyrus-Erie 71-B dragline with 4½-yd. bucket loads a Euc bottom dump. Peter Kiewit Sons' Co., Condon-Cunningham moved 2 million yards of borrow on C 13/14.

9. Construction of all curves to an absolute minimum of 2½°.

10. Prohibition of distracting signboards on the right-of-way and immediately adjacent territory.

11. A fenced-in right-of-way to prevent entry of game and domestic animals.

12. A 300-ft. wide right-of-way all along the route except in Lake County where much of the road will be elevated on structures.

13. Road de-icing equipment at all toll plazas to permit smooth starting and stopping during winter months.

Access Provisions

Twelve interchanges are provided, one at each end of the road, and the others spaced out at convenient locations. Terminal interchanges will be located in Hammond near the Illinois state line and in Steuben County about three miles west of the Ohio border. The ten intermediate interchanges are at these points: Lake County—Buchanan street in Gary and U. S. Routes 12 and 20 in East Gary; Porter County—Indiana Route 49 south of Chesterton; LaPorte County—U. S. Route 421 north of Westville, and Indiana Route 39 north of LaPorte; St. Joseph County—U. S. Route 31 north of South Bend; Elkhart County

A Bucyrus-Erie 54-B equipped with a big 3-yd. clam removes an 18-ft. layer of unstable material for Taylor Bros., of Evansville, Ind., on C 20/21 north of LaPorte.

Concrete pouring and finishing machines put down a long ribbon of pavement on the 12.9-mile S. J. Groves & Sons contract.

—Indiana Route 19 north of Elkhart, and Indiana Route 13 north of Middlebury; Lagrange County—Indiana Route 9 north of Howe; Steuben County—U. S. Route 27 north of Angola.

Acceleration and deceleration lanes adjacent to right hand travel lanes are included at all interchange facilities. Acceleration lanes will permit vehicles to merge safely with through traffic; similarly, deceleration lanes will allow vehicles to drop out of the traffic stream without retarding others. Connecting roads between interchanges and public highways are also part of the toll road construction.

154 Grade Separations

Bridge structures are generally of structural steel on reinforced concrete abutments and piers, with a reinforced concrete deck. Routing of the toll road requires bridge structures for 154 highway grade separations, 26 railroad grade separations, 10 stream crossings, and 61 box culverts.

The roadway will consist of two 12-ft. lanes in each direction. While normal median width will be 40 feet to provide a minimum distance of 56 feet between travel lanes, the median divider in the urban areas of Hammond, East Chicago and Gary will be a raised concrete strip 4 feet wide and 8 inches high.

Roadway alignment has been laid out in such a manner that drivers will have adequate sight distances for braking safely at maximum permissible speeds in the event a traffic pile-up blocks the roadway ahead. Horizontal curves are held to a maximum desirable limit of $2\frac{1}{2}^\circ$ and a maximum allowable limit of 3°. All curves in excess of 0° 15′ are approached through transitions with the paved lanes properly banked. Straight alignment over excessive lengths, reverse or S curves, and compound curves are avoided.

Pavement will have strength to bear the heaviest traffic the toll road will carry with a minimum of maintenance. The reinforced 10-in. portland cement concrete is placed on a 6-in. layer of granular subbase material. The subbase itself is laid on a properly compacted subgrade to prevent pavement failures caused by frost heaving and joint pumping. Shoulders will have a 3-in. thick course of black top placed on select subgrade material. They will have load bearing capacity sufficient for their intended use—as a parking lane for emergency stops, or as an emergency passing lane for vehicles forced off the regular travel lanes.

The history of the big project goes back to 1951 when legislation creating a four-member, bi-partisan toll road commission and authorizing issuance of revenue bonds was enacted by the Indiana state legislature.

Current commissioners are Dillon Geiger, Bloomington, chairman; John A. Stelle, Brazil, vice chairman; and Charles B. Enlow, Evansville, and James Cronin, Jr., Hartford City, members. Virgil W. Smith, Milan, chairman of the Indiana state highway department, is member ex-officio. Executive director of the commission is Albert J. Wedeking.

A preliminary traffic survey was made in 1952 by Parsons, Brinckerhoff, Hall & MacDonald. Engineering studies were made by the J. E. Greiner Co. Total cost of the project was estimated by the Greiner report at $280 million, including interest charges. The Greiner firm was officially appointed engineering consultant to the commission in 1953. Harvey A. Harnden is project manager for the firm.

Estimated major items were construc-

A 50-ton Bros compactor, drawn by an Allis-Chalmers HD-21 tractor, compacts fill near Chicago's city limits for Arcole-Midwest.

Two Cat DW20 motor scrapers, assisted by a D8 pusher, take out sandy borrow material on Kiewit-Condon-Cunningham job.

tion, $176 million; land acquisition, $9.6 million; utilities adjustments, $3.9 million; engineering, $16 million; and administrative and legal expenses, $2.2 million. Finance charges and miscellaneous items were covered by the remainder of the estimate.

A $280 million bond issue to finance the toll road was sold in 1953 to a nationwide syndicate of 429 investment houses headed by Smith, Barney & Co., New York.

Major Quantities

Construction costs were based on the following schedule of quantities of major items:

Grading

Clearing and grubbing	900 acres
Common excavation	17,375,000 cu. yd.
Waterway excavation	112,000 cu. yd.
Peat excavation	2,863,000 cu. yd.
Borrow excavation	24,278,000 cu. yd.
Grade B special borrow	3,551,000 cu. yd.

Ditches

Excavation for ditches	1,535,000 cu. yd.
Foundations—box culverts	54,100 cu. yd.

Structures

Dry Excavation	116,000 cu. yd.
Wet excavation	11,800 cu. yd.
Structural concrete, Class D and F	250,000 cu. yd.

Drainage pipe installation was subbed out by Kiewit-Condon-Cunningham to Alex Metz, Gary. A Northwest dragline with ¾-yd. Mulliken bucket digs the trench.

Reinforcing steel	23,618 tons
Structural steel	60,164 tons
Foundations—piles	480,000 lin. ft.

Pavement

Concrete, portland cement, 10-in.	4,502,500 sq. yd.
Selected subbase material, Grade A	2,497,000 cu. yd.
Macadam shoulders, 3-in.	3,268,000 sq. yd.

For design purposes, the toll road work was divided into 12 sections and a design engineering firm was hired for each of them. For convenience in contract letting, the toll road commission split up the roadway work into more than 50 segments of short lengths. Contracts for construction of maintenance, service and administrative facilities were awarded separately. There were six of the latter.

Contractors were allowed to bid on individual sections or on combinations of the various sections. Each contractor, however, was required to undertake responsibility for all the work to

(Above) A Bucyrus-Erie 6½-yd. electric shovel loads blast furnace slag used as fill material by O'Neil Const. Co. on C 3/4. (Below) A Cat D8 dozer builds up the bank.

(Left) O'Neil's hauling units are Euclid bottom dumps drawn by Cat DW20 power units. (Right) A 22-B pours pier footing.

be performed in the section bid upon. Prime contracts included grading, drainage, structures and paving. This type of package bidding produced intense competition among contractors. Low bids were about 25% under original estimates, with a net saving of $26 million in construction costs to the toll road commission.

Hoosier contractors fared well in getting their share of the toll road business. There were 18 roadway prime contractors working on 56 contract sections and four firms working on various toll road facilities. Out of this total of 22 prime contractors, six were Indiana firms performing work worth more than $39 million. There were also 69 other Indiana firms holding subcontracts amounting to $19 million.

Solitt Construction Co., South Bend, took the largest single contract of the project. This $11,952,670 award was for construction of all ten of the road's service areas. In another $1,655,530 contract, Solitt also built five maintenance buildings.

Some of the best known names among earthmoving contractors are engaged on the toll road project. Western Contracting Corp., Sioux City, Iowa, has the longest stretch of roadway. The firm's contract covers a 13.9-mile job in Elkhart County costing $7,408,867 and a 14-mile job in Elkhart and Lagrange counties with a price tag of $6,898,685.

12.4-Mile Groves' Job

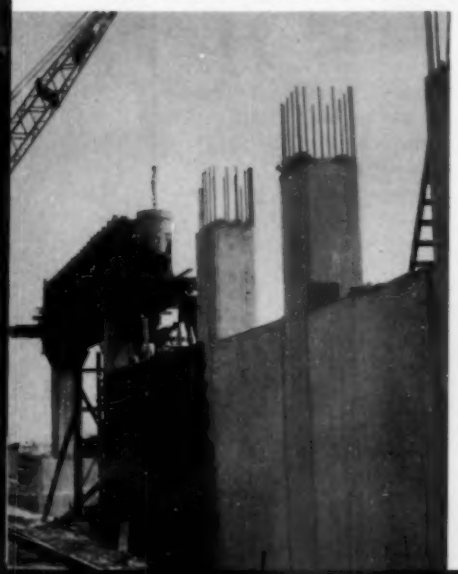
S. J. Groves & Sons Co., Minneapolis, has a 12.4-mile contract in Lagrange County worth $6,739,335. Union Building and Construction Corp., Passaic, N. J., is building 13.1 miles of road in Lagrange and Steuben counties at a cost of $6,019,594. One Canadian contractor is working on the toll road. Tomlinson Construction Co., Ltd., Toronto, Ont., holds a $3,990,620 contract for an 8.4-mile section in LaPorte County.

Construction of the toll road got off to a late start in fall 1954, when the first contracts were let. During the 1955 construction season, the quiet farm land, marsh and moraine country of northern Indiana became a beehive of activity as contractors set to work a huge task force of men and equipment. At work were 60 cranes and draglines, 150 scrapers, bottom-dumps and end-dumps, 200 dozers and graders, and an army of 6,238 workmen and engineers.

Contractors put crews on round-the-clock shifts hauling dirt. Concrete went down at the rate of half-mile a day, and by the end of the 1955 paving season, 65 miles of dual lane roadway were in place. At times during 1955, the work had lagged behind as much as 16.4%,

Continued on page 63

(Left) A 22-B Transit Crane pours the form for an overpass structure. (Right) A 38-B drives 45-ft. lengths of piling for abutment.



White's Uvalde Mines setup is shown here—from the 29-T blast hole drill, to the pit and the crushing-screening plant.

Strangest Rock in the Southwest

By Ray Day

MANY years ago, Mother Nature visited south Texas near Uvalde and played a prank on geologists. In doing so, she did Texas roadbuilders a distinct favor. What she left behind, after confounding the geologists, was rock asphalt, one of the Southwest's strangest rock formations and one of its best roadbuilding materials.

Many miles of modern Texas highway are smooth and durable because of Uvalde's deposits. The whimsical fates which placed rock asphalt there gave southern Texas a head start over the rest of the country in the matter of high-grade asphalt highways. Since about 1908, the deposits have been mined and pulverized for roadbuilding materials. Even before 1908, the bitumen content was extracted to make valuable roofing material.

Rock asphalt is nature's ready-made road material, but mines like White's Uvalde setup in south Texas show that it is hard to dig and handle because of peculiar, interesting tendencies.

One of the large rock asphalt mining enterprises located in the district is White's Uvalde Mines. Since 1948, White's Uvalde Mines has excavated and crushed a huge block of rock asphalt measuring approximately 1,000 feet long, 800 feet wide and 120 feet deep. Before 1948, the company operated another mine only a short distance away. The new location is more productive and the asphalt content is higher. It has been possible in the entire pit to dig and blend material which falls within the 5 to 9% asphalt content required by specifications of White's biggest customer, the Texas State Highway Department.

The rock asphalt formation is one of the rarest in the Southwest, one of the few places on earth where limestone has been impregnated with a high grade of natural asphalt. Elsewhere in the United States, notably in eastern Utah and western Colorado, asphalt-impregnated sandstone occurs, but at Uvalde the impregnation is in hard, dense limestone rock. It is an excellent roadbuilding material.

As nearly as geologists have been able to reconstruct what happened, the limestone at one time was an oil-bearing formation buried deep within the earth's surface. Movements in the earth's crust occurred ages ago. In the raising process, the oil-bearing lime rock was

pushed close to the surface of the ground. At White's Uvalde Mine, the formation is covered with only 15 to 25 feet of limestone-caliche overburden.

In time, as the oil-bearing formation was exposed to the earth's atmosphere, the lighter oils—naphtha, benzine, kerosene, gasoline—evaporated, leaving only a pure residue of good asphalt. Tests show that the material is practically the same as the pure native asphalt in Trinidad, off the coast of South America. The asphalt is stiff and has excellent ductility when extracted. The ASTM penetration factor for the Uvalde asphalt is approximately 10, an indication of the stiffness or freezing point of this material.

No Oil Fields Near

Strangely, no oil fields are located near the deposit. What oil there was evaporated from the formation, according to geologists, and the only thing left now is the dull grayish black limestone.

From an excavating standpoint, the material is especially interesting. It behaves like no other rock on earth. Its color is dull. It has a tendency toward springiness, like rubber. In walking across the surface of the pile of crushed material, there is hardly a sound. High explosives used in the formation have shown a discouraging tendency to be absorbed by the springiness of the material, unless the heavy charges are expertly placed in fairly tight hole centers. A bank of broken rock on the quarry floor shows exactly the same crawling tendencies as a load of hot plant mix in a truckbed; in other words, fragments of the bank will continuously ravel until a major cave-in brings tons of material tumbling down toward the toe. In the fat spots, where the asphalt content is high, a rotary drill bit pushed too fast will develop enough heat to cover its rollers with the thick viscous asphalt, so that drilling must stop until the bit is brought up and washed clean in gasoline.

Crushes Like Limestone

Despite these odd features, however, the material is one of the best asphalt roadbuilding substances known. The rock asphalt will crush like limestone and lie inert and dry for months without any apparent change. If about 3% of fluxing oil is mixed into this aggregate, results are dramatic and immediate. The fluxing oil activates the natural asphalt. The particles tend to fuse together in a solid rock-like mass. If the material is laid on a highway subbase, spread with a motor grader and then rolled by a heavy-duty roller, it goes together to make a solid rock sheet of the same hardness as the parent formation. The quality of these rock asphalt pavements is evidenced by the fact that many roads and streets in Texas have been laid for more than 40 years and still are giving good service.

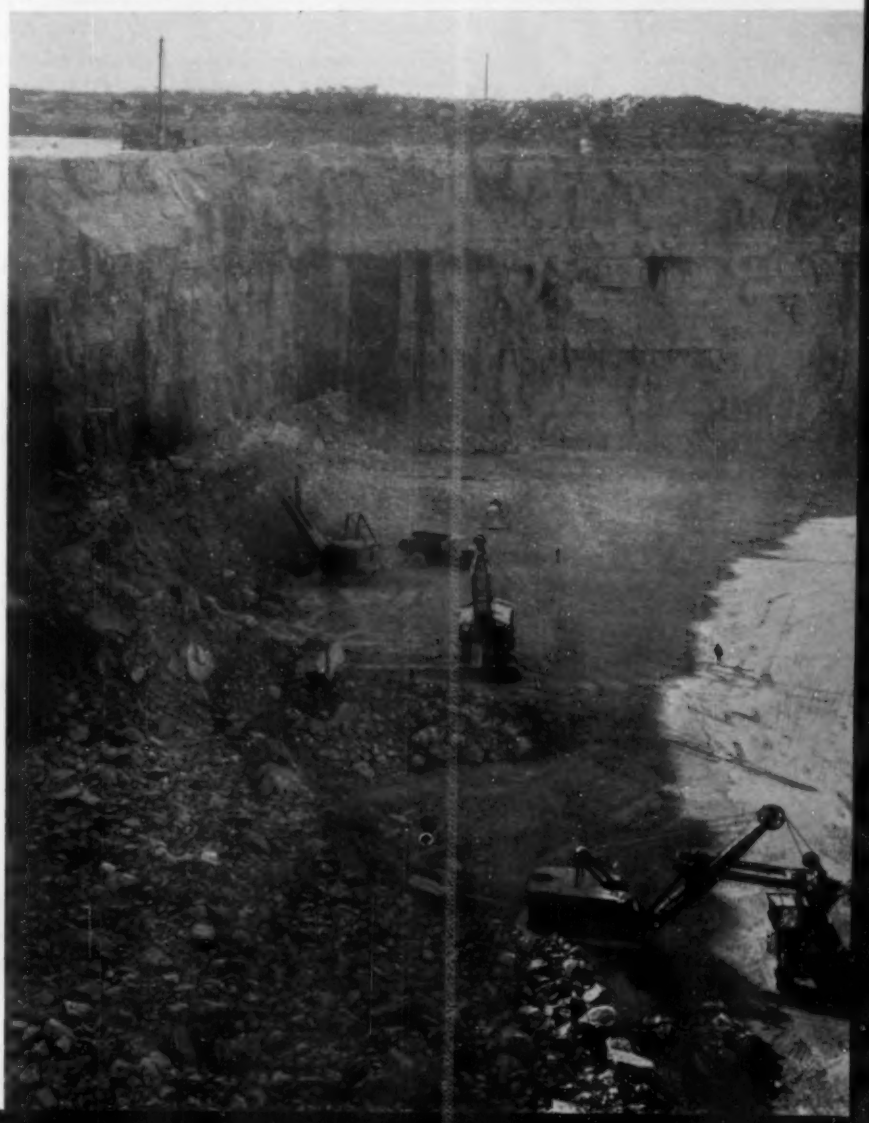
The Uvalde Mine currently is serving a wide market, with railroad and truck shipments of the material reaching to the Mexican border to the south and over a considerably wide area covering most of Texas. Some material is shipped to Louisiana and a few carloads of dry, pulverized material have been shipped, minus the fluxing oil, as far away as Chicago for various flooring purposes.

The peak production season usually begins about March 1 and extends through the end of October. During this period, from 800 to 1,000 carloads of material leave by railroad each month. Lesser shipments go by truck. Modernization of screens, crushers and conveyor systems last winter boosted the plant's potential output to 1,200 cars per month. At present, the mining end of the operation is working five eight-hour shifts per week, while five 24-hour days are worked by the crushing and mixing end.

Modernization Continues

In line with many commercial rock-production setups, the White's Uvalde Mines operation is undergoing a steady modernization. When the mine first was established, all electric power was generated at the site by diesel-electric plants. In those days, if anything gave the least amount of trouble while the plant was operating at its then peak capacity, there was trouble aplenty. Recently, the use of the diesel-electric powerhouse was abandoned. Electric

Down in the pit, two 2½-yd. shovels—a Bucyrus-Erie (foreground) and a Northwest (background)—load rock, while an old Bucyrus-Erie 50-B crane breaks rock.



Here's a closeup of one of the shovels as it loads rock asphalt to a dump truck. Muck pile was broken down by explosives.

power now is brought in on high-tension poles from Central Power & Light of Uvalde. Old loading shovels have gradually been replaced with newer, more mobile equipment. Hauling units have been made more dependable by modernization. Some demonstrations of rotary drilling equipment have been made with a view toward replacement of the churn-type method traditionally used.

Drilling in rock asphalt is an extremely interesting operation, chiefly because of the behavior of the formation. Two types of drilling are being used: 4¾-in. diameter holes are being put down by a demonstration Davey rotary drilling machine and 7¾-in. holes are

A load of rock asphalt drops from the dipper of the other shovel. The two shovels work in the pit five days a week.

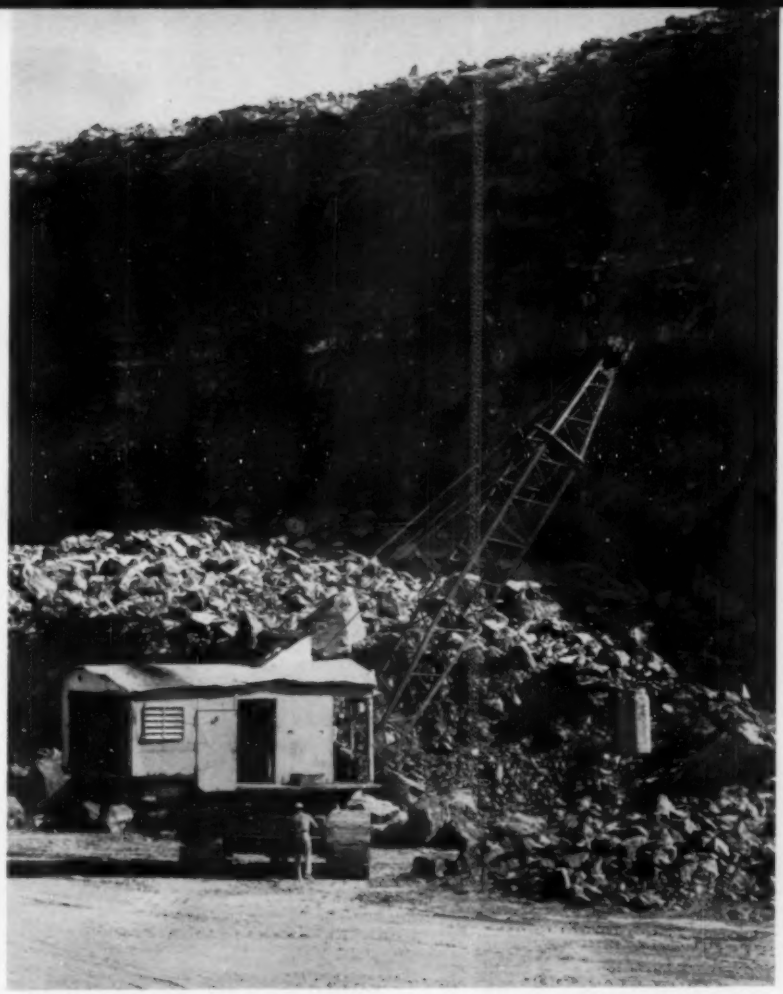
being drilled by a Bucyrus-Erie 29-T blast-hole drill.

While the Davey rotary machine has drilled a few holes the full depth of the 120-ft. face, using Varel rotary bits, its chief demonstrating use so far has been in the drilling for removal of from 15 to 20 feet of hard caliche overburden which covers the rock asphalt formation. These smaller-diameter holes are being put down nine feet from the bank edge, with 15-ft. spacing between holes.

Peculiar Drilling Features

One of the peculiar features noted on rotary drilling is that the drill bit tends to melt nearby asphalt in the fat streaks. This clogs up the rollers on the drill bit. Rotary drilling shows some tendency to run, particularly when too much pressure is exerted on the drill bit. The direction of run is governed by varying degrees of hardness in the material, as well as by the degree of true level of the machine itself. The tendency is expected to correct itself as drillers obtain more experience with the formation.

The 29-T blast hole drill, using 7¾-in. Bucyrus-Erie bits, is able to drill a hole 123 feet deep in an eight-hour shift. Action of the rock asphalt on a churn drill bit is normal for soft material: it chews up readily, pulverizes easily and is not exceptionally abrasive. The rich streaks, where asphalt content runs as high as 12%, seem to make little



Using a 4-ton Cape Ann steel breaking ball, the old 50-B further breaks down large chunks of the rock into sizes that can be handled efficiently by the 2½-yd. shovels.

Stripping of this upper ledge of limestone-caliche overburden is necessary before mining of the rock asphalt can begin.

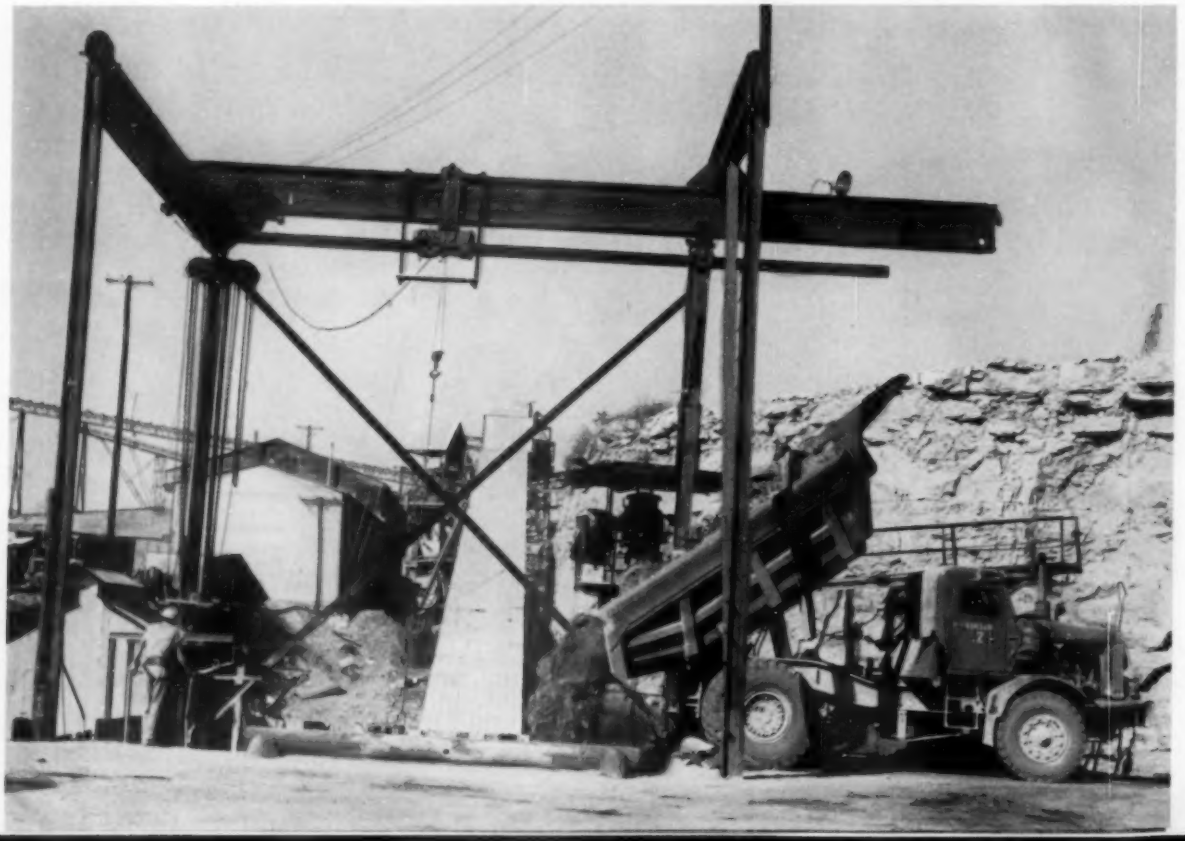
difference to the bit on a blast hole drill. The material picks up well in a bailer. Whatever free asphalt there is tends to emulsify with the drilling water.

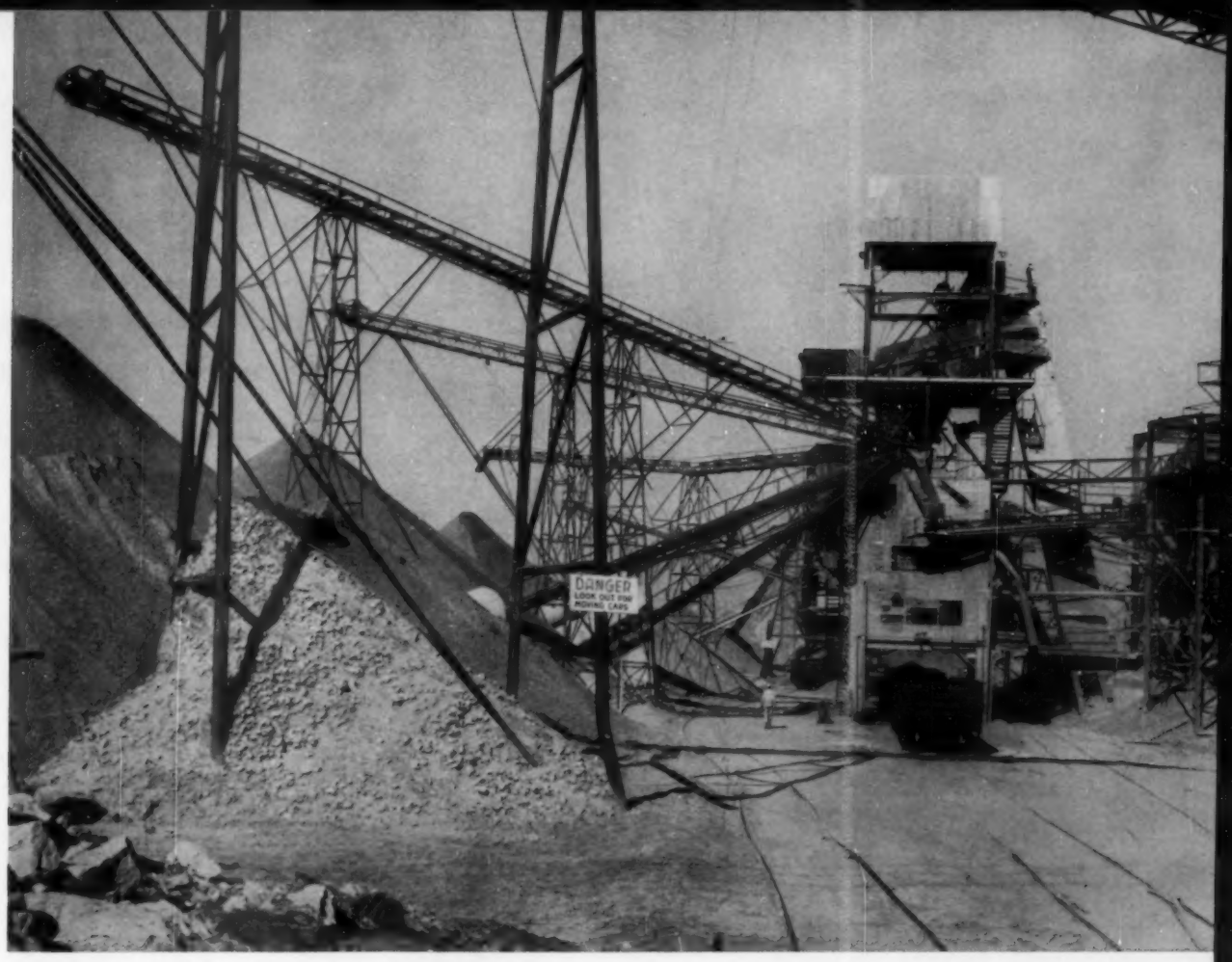
Both the churn and rotary-drilled holes are being exploded by Gelamite and Hercomite powders. An efficient method has been found to get the best possible breakage of the material with high explosives. It is a change from the old days when a single row of holes next to the face was shot. Often the explosive force of the powder dissipated against the rubbery formation. Today, two rows of holes are loaded, the first kicking out instantaneously. The second row follows thousandths of a second later as an MS delay explodes it.

The 123-ft. holes generally are loaded with approximately 2,000 pounds of Hercomite B in 6-in. cartridges. On all powder loading, the bags are slit with a knife and dropped in, permitting the powder to spread out against the sides of the drill hole.

The general practice on large-diameter holes is to load them to within 18 feet of the ground surface without springing, to deck to 14 feet, and then put in about ½ stick to give some cracking effect to the top. The first row of holes, 20 feet back from the face and 30 feet apart, is hooked to a Primacord trunk line. The second row of holes is

(Above) W. R. Reasoner, assistant mine manager, exhibits a chunk of rich rock asphalt. (Below) An end dump deposits a load of rock into feeder hopper of crusher.





Conveyors lead out from the heart of the Uvalde setup to store several sizes of material. Blending is done later.

equipped with MS connectors to create the short delay. Hole spacing is on a square grid. Shots pulled by this method usually are grouped with 15 to 20 holes to a blast. The same scheme was used for the first time on rotary drilling, except that the centers were closed up more and the powder cartridges were smaller.

The pile of muck, which averages about 35 feet high after being broken down by high explosives, is being loaded by a pair of power shovels: a Bucyrus-Erie 54-B and a Northwest 80-D. Both machines have 2½-yd. Amsco dippers. These shovels position themselves directly in front of the spoil bank, so that with a maximum 180° swing they can load the hauling units as they drive by. Between loads, a Caterpillar D7 dozer cleans up the pit floor around both machines.

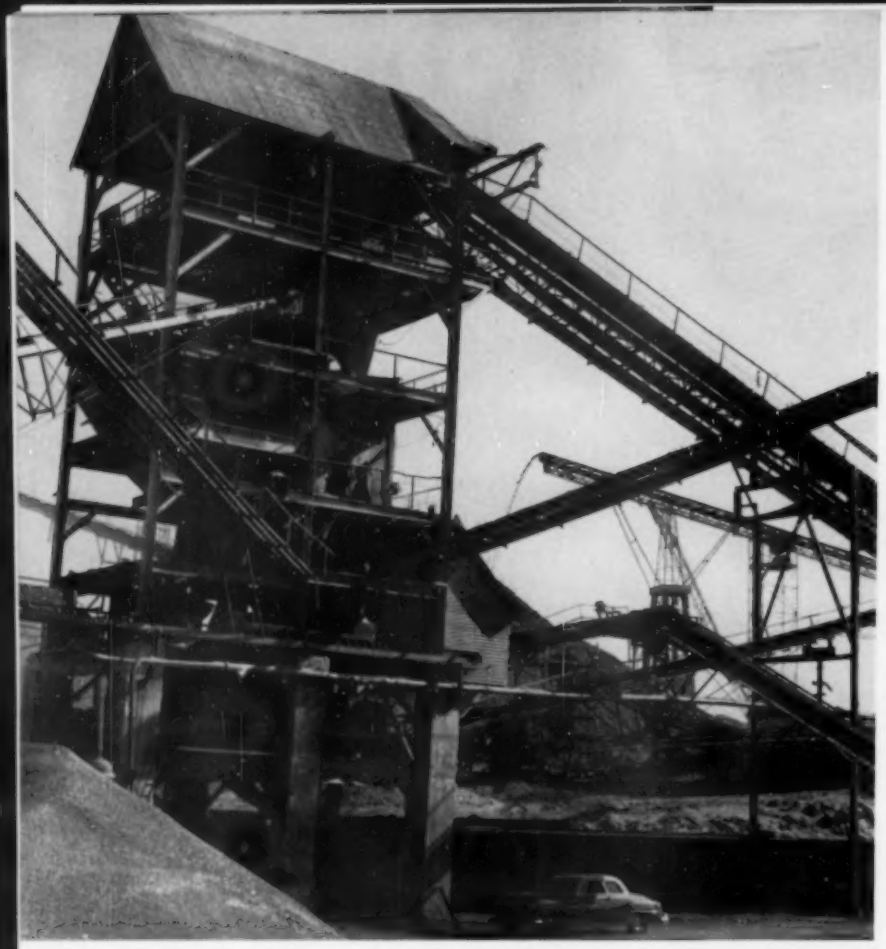
Hauling equipment includes four 22-ton Euclid end-dump trucks and three Sterlings which average about 17 cubic yards of payload each trip. The hauling trucks either drive past the power shovels or back in if the bank has a ragged edge. Loading is a steady bailing operation, because day-shift work must stock up the plant with a surge pile of rubble rock to keep it going for the next 16 hours. The maximum amount of material leaving the pit in eight hours has been 252 loads averaging 17 cubic yards each.

Old 50-B Active

Even the loading operation has had its share of rock asphalt characteristics which tend to impede progress. For example, when the shots roll out boulders or rock fragments larger than the 2½-yd. dippers can handle, they have to be broken further. This reduction process is a job for an old Bucyrus-Erie 50-B crane, which handles a 4-ton Cape Ann steel breaking ball. There also has been some secondary drilling, with three or four jackhammers supplied with air from a Gardner-Denver portable diesel air compressor.

A second loading problem has been blending materials of various degrees of enrichment, so that the finished product consistently stays close to the tolerance center point of Texas State Highway Dept. specifications. These usually require 5 to 9% of asphalt content. There are some places in the pit where the asphalt content drops down to 4%; in other spots it goes as high as 12%. There are even a few pockets or fissures where the asphalt is completely free, so that the percentage is nearly 100. The ideal way to run the plant is to load various materials as to their degree of enrichment in about the right proportion to keep the asphalt content of rock entering the plant at about 6 or 7%. This can be done easily by spotting the 54-B in one section of the pit and the 80-D in another. The rock then is loaded out with the finished blend in mind.

The ledge of rock asphalt is 120 feet high as White's crews are mining it. Actually, the deposit is thicker than that, but the never-ending laws of eco-



(Above) This is mixing plant No. 2. (Below) This new stacker conveyor system was erected a few months ago with the aid of Sonotube paper forms for the concrete legs.

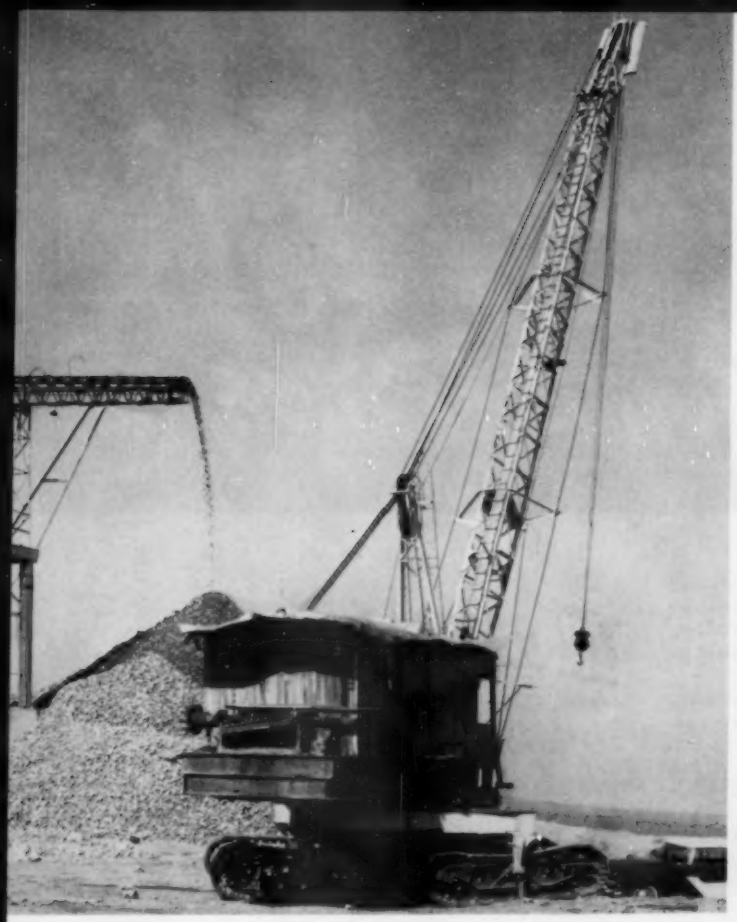
nomics work here the same as everywhere else, and the point of diminishing return cost-wise makes it prohibitive to go deeper. To do so would cause a much steeper and somewhat longer uphill haul, and a ground water problem might develop. As it is now, there is no free ground water in the hole. Flash rains tend to flood the bottom of the pit, but portable centrifugal pumps quickly dry it out. The area in which Mother Nature left the rock asphalt deposits is not in a very heavy rain belt.

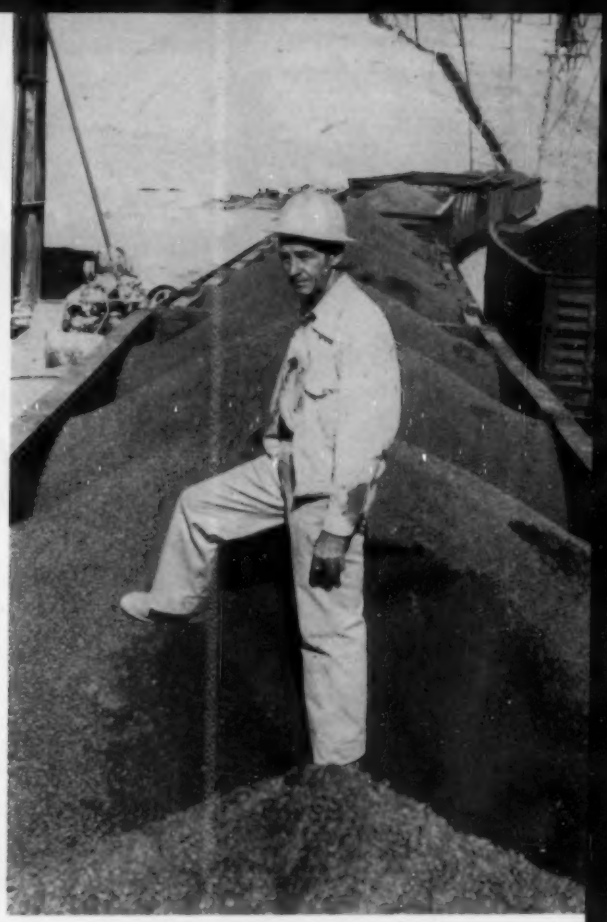
Another excavation problem is that of stripping. Since the cubic yardage of caliche stripping averages only from 10 to 15% of the mined rock asphalt, it is usually possible to stay ahead easily with the stripping. During the week, while drills and powder crews are working, the overburden rock can be drilled and shot along with the regular orebody. Actual loading and hauling of this material usually is accomplished a considerable distance ahead during the winter months. When peak seasons arrive and the rock asphalt face begins to catch up, trucks and both power shovels are walked out of the pit on Friday evening for an occasional full week end of stripping. By working a few week ends during the summer, these two machines have been able to stay well out ahead with the stripping. The caliche is being wasted in gullies away from the plant.

Equipment Changes Made

Various changes made recently in the type and capacity of crushing, screening and conveying equipment in the reduction plant have boosted its capacity to 1,200 railroad cars of premixed material per month. Although the plant setup has much old equipment scattered around, it is modern in every respect so far as its conception is concerned. The plant is laid out basically: 1, so that enough coarse material can be stored in a surge pile to keep the plant running 16 hours while the pit is still; 2, so that four basic stockpiles of material can be created and kept in constant storage; and 3, so that these stockpiles can be pulled back in with various degrees of feed to make whatever mix gradation may be required by the specifications.

The usual specification sizes of rock are so fine that it takes much blending reserve to do this. For example, the coarsest-size surge pile has particles ranging from one inch to ⅝ inch. The second size is from ⅝ inch to ⅜ inch. Then comes ⅜ inch to No. 4, a





(Left) An old Class 14 Bucyrus still is active. (Right) Superintendent D. A. Valentine stands atop finished product.

pile containing particles from ¼ inch to 10 and, finally, a dust pile containing minus 8 mash material. These four gradations can be blended over screening equipment to produce practically any mix to any specification that might be demanded for a paving product.

The above fifth gradation of minus 8 mash material is manufactured in a much greater quantity than can be used in the various mixes that are made and sold. White's mines have accumulated a stockpile of approximately 500,000 tons of these so called "excess fines" for which no market has been developed.

500-ft. Belt Conveyor

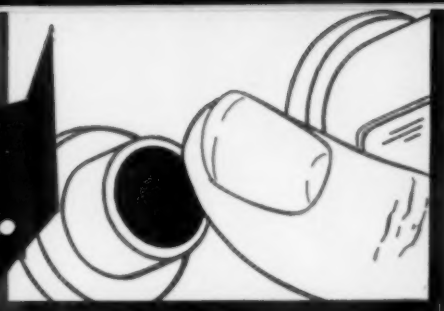
Before the pit-run material enters these finer reduction processes, it is first hauled to the top of the pit by Euclids and Sterlings and is dumped to a 42-in. Allis-Chalmers Superior McGully gyratory crusher powered by a 200-hp electric motor. This crusher breaks the material down to six inches or smaller. A 500-ft. 36-in. Goodrich belt conveyor run then hoists the gyratory output to the top of a large 5 x 14-ft. heavy-duty Allis-Chalmers vibrating screen which retains everything from ¾ inch to six inch and stores it temporarily in a large surge pile to one side. The minus ¾-in. product goes through into the plant for classification, reduction and storage.

As an indication that the rock asphalt still is rubbery and hard to break when it enters these two reduction plants, No. 1 plant has a 4¼-ft. Symons standard cone crusher, a 4-ft. Symons shorthead cone crusher, a 4-36 Allis-Chalmers Gyrocone crusher, a 3-22 Allis-Chalmers crusher and two 2-22 Allis-Chalmers Gyrocone crushers. The screening system in this plant includes a pair of Allis-Chalmers 5 x 14 Ripl

Continued on page 68

Sam Lumsden, manager of White's Uvalde mine, sits at his desk. Uvalde's rock asphalt deposits are responsible for many miles of smooth highways in the state of Texas.

PUSH THIS BUTTON...



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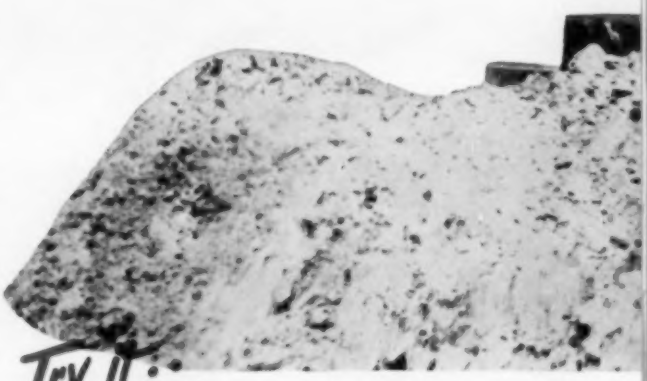

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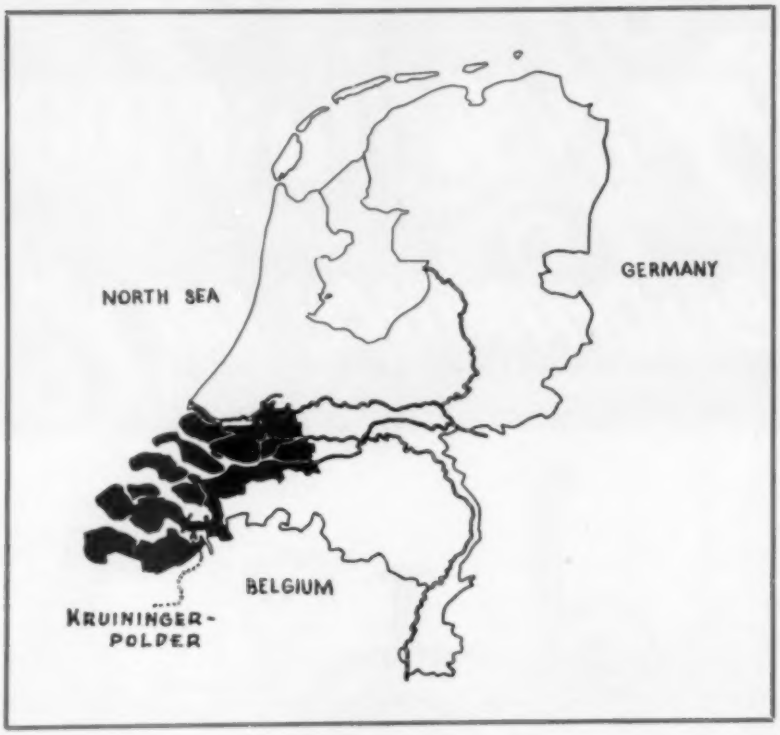
Indomitable Dutch Restore Land Hit by Flood

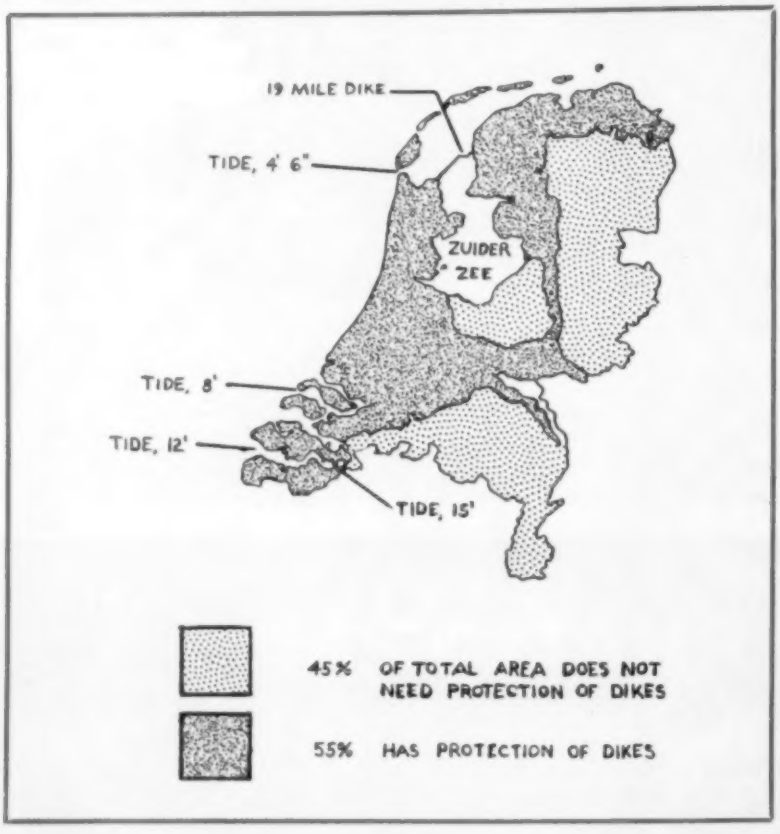
By H. Scheer
Arnhem, Holland

HOLLAND'S battle against the sea, a relentless—and sometimes ruthless—foe, never ends. Spirited Dutchmen have been building dikes, dams, canals, locks and pumping stations on a large scale ever since the 17th century to reclaim land and protect existing land.

Land is precious in the Netherlands, whose 15,450 square miles are populated by 10½ million persons. This is an average of more than 700 persons per square mile and compares with the 520 who reside per square mile in the combined states of Connecticut, Massachusetts and Rhode Island.



(Above) Areas of the Netherlands flooded by the great storm of 1953 are shown in black. (Below) Map shows that more than half of country needs protection of dikes.



About 25% of the Netherlands is below sea level. Without the protection of 1,500 miles of sand dunes and dikes, much of the historic Lowlands would be flooded by the North Sea twice a day.

The average flood level of the North Sea could inundate most of the provinces of North Holland, Zeeland, South Holland, the Northern part of Groningen and Friesland and the western part of Utrecht.

The Dutch built their dikes long; they built them sturdy; and they built them high.

But these sea walls were no match for an extremely rare combination of elements—the simultaneous assault of a 100 mph gale and a high spring tide—that struck on January 31, 1953. The two weeks that followed were dark ones for the Dutch.

During the fateful night of January

Here's the story of how the Kruininger Polder mobilized after disastrous '53 storm.

Scenes like this were common after the water had subsided. Some 30,000 houses and farms were either destroyed or damaged.

31, the storm breached dikes in many places. Some of the breaches widened to 600 feet. Water poured through. Much of the land (polders) that had been so painstakingly reclaimed from the North Sea was flooded with salt water from the same sea.

About 400,000 acres of land were flooded, more than 80% of which was cultivated. More than 100 villages were in the path of the flood. Nearly 1,800 persons lost their lives. Some 30,000 houses and farms were destroyed or damaged. About 50,000 cattle and numerous other animals perished.

Severe damage was caused to about half of the nearly 700 miles of dikes in the calamity area.

Damage was conservatively estimated at nearly $300 million.

Dutch spirit was not destroyed. The tremendous job of reclamation and restoration was begun immediately.

The first problem was to repair the breaches in the dikes, to keep them from widening and deepening from the scouring action of the tides.

Polders had to be pumped dry, because it was impossible for them to be drained by normal means, through sluice gates.

After the pumping was completed, the problem of restoring the soil was considered. Generally, the land was covered with salt water, which infiltrates the subsoil and kills plant life. Restor-

Sand bags helped to fill the breaches after the flood. About 400,000 acres of land, most of which were cultivated, were flooded.

A Ruston-Bucyrus 22-RB loads sand into a dump truck. Sand damage was heavy.

ing such land to its original productivity is an expensive and scientific process.

Salt which permeates the soil entirely damages it by destroying the soil structure and by "poisoning" the water which is absorbed by the plant roots. Soil which was miliary, loose and permeable became hard—so hard, in fact, that pools of water remained on it after rainfalls.

To restore the miliary structure, the soil was spread with gypsum, large quantities of which were imported from France.

It was not only the salting of the subsoil water which damaged the land, however. To illustrate this, let's examine the flood damage caused in the Kruininger Polder, which contains about 3,700 acres.

A formidable breach in the Kruininger dike allowed 46 million cubic yards of water to stream in and out of the polder twice each day. The breach was closed after a few months of continuous work.

After the land was pumped dry, most of the farms were found to be badly damaged or virtually eliminated. Gullies destroyed about 60 acres of land; the furrow was washed away in another 345 acres. A total of about 1,100 acres was covered with an average sandlayer 50 to 60 centimeters (1.6 to 2 feet) deep.

Roads Eliminated

The tides had clogged all ditches and drains. Roads were eliminated in places; a thick layer of silt or sand covered them in other places.

Much of the topsoil was carried out to sea. The topsoil was replaced by about 2 million cubic meters of sand which streamed through the dike breach.

Restoration activities in the Kruin-

Bulldozers played an important part in the restoration activities on the Kruininger Polder, where sand covered 1,100 acres.

Another dragline excavates sand from a farm. Sand layer here is about 1½ feet.

inger Polder proceeded along these lines: cleaning and restoring polder roads; restoring drainage; removing sand from the land; deep plowing; and "digging" with draglines.

About 31 miles of road had to be restored—after removal of the sand cover, of course. The sand was removed by draglines. Dump trucks operated under them when the condition of the roads allowed, which was not often in the early phases of the operation.

The draglines piled the sand to the side of the roads for removal later when the roads could handle the heavily-laden trucks. Along with clearing the roads, the draglines also cleaned out the ditches alongside.

Ruston-Bucyrus, Michigan and Unit draglines, none of which weighed more than 15 tons, were used to clean out about 75 miles of drainage ditches. Great care was exercised in this operation, with the loss of a machine in the mud a possible penalty for carelessness. The draglines were positioned on specially-constructed wooden supporters 26 feet long.

With the drainage ditches restored, the next job was to clear sand from more than 1,100 acres of land. Removal of about 1,243,000 cubic yards of sand from more than 900 acres was handled by 16 draglines, 4 bulldozers, 40 dump trucks and 14 sand trains, which were pulled over narrow gauge lines.

Much of the sand was used to fill the scoured gullies. The average haul from draglines to dump sites was 3,900 feet.

To protect the road surface against the weight of the dump trucks, it was covered with a layer of sand varying from 60 to 80 centimeters (about 2 to 2½ feet) deep. The sand later was removed.

Some of the parcels of land on the polder, however, were located too far from the gullies to allow economical hauling of the sand. Two other methods were devised to solve this reclamation problem.

A deep plowing operation, in which clay was brought to the surface and the sand cover plowed under, was employed on about 150 acres.

Hydraulically-Operated Cutters

Equipped with two hydraulically-operated cutters, the tractor-drawn deep plow had a maximum working depth of about four feet. The adjustable front blade shoved the sand layer underneath the top-soil. The back blade turned the subsoil on the sand.

Still another method, this one involving draglines, was used on 50 acres. Under this method, the topsoil was kept on the surface. To illustrate how this method worked, suppose that there are three pits, A, B and C, each seven yards wide. The dragline took the sand from the top of pit C and placed it at the bottom of pit B, where it was levelled. The topsoil of pit C was cast on top of the clay

Continued on page 69

(Above) Trucks dump sand into gullies. (Below) This tractor-drawn deep plow was used on about 150 acres to bring clay to the surface and turn under the sand cover.

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Sociedade Tecnica de Materiais "SOTEMA" S/A, Sao Paulo, Rio de Janeiro, and Curitiba.

BRITISH GUIANA: Tractor & Motor Co., Georgetown.

BRITISH HONDURAS: R. H. Eyles, Belize.

BRITISH ISLES: Ruston-Bucyrus Ltd., London and Glasgow.
Ruston & Hornsby Ltd., Bristol.

BURMA: William Jacks & Co. Ltd., Rangoon.

CAMBODIA: See French Union.

CAMEROUN: See French Union.

CEYLON: Brown & Co. Ltd., Colombo.

CHILE: International Machinery Co., Santiago and Antofagasta.

COLOMBIA: International General Electric, S. A., Inc., Barranquilla, Bogota, Cali, and Medellin.

COSTA RICA: Alberto L. Arce S. A., San Jose.

CUBA: Armando J. Valdes & Cia., Havana.

CYPRUS: The Cyprus Commercial Co. Ltd., Nicosia.

DENMARK: E. T. Grew A/S, Copenhagen.

DOMINICAN REPUBLIC: La Antillana Comercial e Industrial, C. por A., Ciudad Trujillo.

ECUADOR: M. Ribadeneira Saenz, Quito.

EGYPT: The Tractor & Engineering Co. S. A. E., Cairo and Alexandria.

EIRE & NORTHERN IRELAND: Ruston & Hornsby Ltd., Dublin.

EL SALVADOR: Casa B. Sol-Millet, San Salvador.

ETHIOPIA & ERITREA: Paul Ries & Sons (Ethiopia) Ltd., Addis Ababa.

FIJI ISLANDS: Morris Hedstrom Ltd., Suva.

FINLAND: Aktiebolaget Ekstroms Maskinaffar, Helsingfors.

FRENCH UNION

FRANCE: Ets. J. Couthon-Brunner & Marchand (E. C. O. B. E. M.), Paris.

— Their sub-distributors —

ALGERIA: Societe "IMEX", Algiers.

CAMBODIA: Denis Freres d'Indochine, Saigon.

CAMEROUN: Compagnie Francaise de l'Afrique Occidentale (C. O. F. A. O.), Douala.

FRENCH EQUATORIAL AFRICA: C. O. F. A. O., Brazzaville.

FRENCH WEST AFRICA: C. O. F. A. O., Dakar, Senegal; Abidjan, Ivory Coast.

FRENCH MOROCCO: Etablissements Groslin, Casablanca.

LAOS: Denis Freres d'Indochine, Saigon.

MADAGASCAR: Soc. F. Bonnet & Fils, Tananarive.

TUNISIA: MINE-USINE et COMPTOIR DES MINES Reunis, Tunis.

VIETNAM: Denis Freres d'Indochine, Saigon.

GERMANY: W. Strikfeldt & Co., Gummersbach, Rheinland, West Germany.

GOLD COAST: Holman Bros. Ltd., Takoradi.

GREECE: Alec C. Triandafyllides, Athens.

GUATEMALA: Comercial MacDonald (Guatemala) S. A., Guatemala City.

HAITI: Compagnie Haitienne de Moteurs, S. A., Port-au-Prince.

HAWAIIAN ISLANDS: Theo. H. Davies & Co., Ltd., Honolulu and Hilo.

INDIA: Greaves Cotton & Co. Ltd., Bombay, Calcutta, Kanpur, Madras, and New Delhi.

INDONESIA: Lindeteves N. V., Amsterdam, Netherlands.

IRAN: Soufar Trading Co. Ltd., Teheran.

IRAQ: John Birch & Co. (Iraq) Ltd., Baghdad, Margil, and Mosul.

ISRAEL: Agricultural Engineering Co. of Israel Ltd., Haifa.

ITALY: M. I. D. E. C., Macchine Minerarie Edili ed Industriali, Milan.

JAMAICA: H. E. Robinson & Co. (Jamaica) Ltd., Kingston. (Excavators). Caribbean Industrial Equipment, Ltd., Kingston. (Water Well Drills).

JAPAN: Daiichi Bussan Kaisha, Ltd., Tokyo.

JORDAN: Nagib Baki & Sons (Transjordan) Ltd., Amman. (Drills only).

KENYA: Gailey & Roberts Ltd., Nairobi.

KOREA: American Trading Co., Inc., Seoul.

KUWAIT: T. Ward Brown, Mohamed Abdul Rahman Al-Bahar, Al Kuwait.

LAOS: See French Union.

LEBANON: Nagib Baki & Sons, Beirut. (Drills only).

LIECHTENSTEIN: Robert Aebi & Co. Ltd., Zurich, Switzerland.

LUXEMBURG: Bergerat-Dutry S. A., Brussels, Belgium.

MADAGASCAR: See French Union.

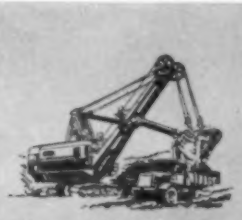
MALAYAN FEDERATION: Harper Gilfillan & Co. Ltd., Kuala Lumpur, Selangor.

Oil Well Drills

Stripping Shovels

Water Well Drills

Crawler Cranes



Quarry & Mine Excavators

ALL OVER THE WORLD

BUCYRUS EXCAVATORS, CRANES and DRILLS

MEXICO: Equipos Mecanicos, S. A., Mexico 5, D. F.; Chihuahua, Guadalajara, and Hermosillo.
Equipos Mecanicos del Norte, S. A., Monterrey and Tampico.
Equipos Mecanicos de la Laguna, S. A., Torreon.
Tubos y Equipos de California, S. A., La Paz. (EMSA Sub-Distributor, Territory of Baja California).
Crook Company, Los Angeles, California. (Excavators in State of Baja California).
Drilling & Mining Equipment Co., Los Angeles, California. (Water Well Drills in State of Baja California).
The Myers Co., El Paso, Texas. (Water Well Drills in States of Chihuahua and Durango).

MOROCCO, FRENCH: See French Union.

MOZAMBIQUE: Monteiro Gomes, Ltda., Lourenco Marques.

NETH. NEW GUINEA: Lindeteves N. V., Amsterdam, Netherlands.

NETHERLANDS: Wynmalen & Hausmann N. V., Rotterdam.

NEW ZEALAND: John Burns & Co. Ltd., Auckland, Christchurch, Greymouth, and Wellington.

NIGERIA: Holman Bros. Ltd., Port Harcourt.

NORTHERN RHODESIA: Hubert Davies & Co. Ltd., Lusaka and Ndola.

NORWAY: Maskin A/S Pay and Brinck, Oslo.

PAKISTAN: Greaves Cotton & Co. (Pakistan) Ltd., Dacca, Karachi, and Lahore.

PARAGUAY: General Electric, S. A., Buenos Aires, Argentina.

PERU: International Machinery Co., Lima.

PHILIPPINES: G. A. Machineries Inc., Manila.
Lilestone & Co., Inc., Manila.

PORTUGAL: Monteiro Gomes, Ltda., Lisbon.

PUERTO RICO & VIRGIN ISLANDS: Ulpiano Casal, Inc., San Juan, Puerto Rico.

SAAR: Ets. J. Couthon-Brunner & Marchand (E. C. O. B. E. M.), Paris, France.

SAUDI ARABIA: The Arabian Trading Co., Jeddah.
John Birch & Co. (Saudi Arabia) Ltd., Damman.

SINGAPORE: Harper Gilfillan & Co. Ltd., Singapore.

SOUTHERN RHODESIA: Hubert Davies & Co. Ltd., Salisbury, Bulawayo, and Gwelo.

SPAIN (incl. Colonies): Gummersindo Garcia, S. A., Madrid.

SUDAN: Sudan Mercantile Co. (Engineers) Ltd., Khartoum; Sudan Mercantile (Wad Medani) Ltd., Wad Medani; Sudan Mercantile (Port Sudan) Ltd., Port Sudan.

SURINAM: J. F. D. Haenen Co. Ltd., Paramaribo.

SWEDEN: Ternborg & Lundberg A/B, Stockholm.

SWITZERLAND: Robert Aebi & Co. Ltd., Zurich.

SYRIA: Barada Trading & Engineering Co. S. A., Damascus. (Drills only).

TAIWAN: Wayfoong & Co., Taipei.

TANGANYIKA: Gailey & Roberts (Tanganyika) Ltd., Dar es Salaam.

THAILAND: Gerson & Sons Ltd., Bangkok.
Harper Gilfillan & Co. Ltd., Kuala Lumpur, Selangor.

TRIESTE: M. I. D. E. C., Macchine Minerarie Edili ed Industriali, Milan, Italy.

TRINIDAD: Neal & Massy Engineering Co., Ltd., Port-of-Spain.

TUNISIA: See French Union.

TURKEY: Said Dormen ve Ort, Istanbul.

UGANDA: Gailey & Roberts (Uganda) Ltd., Kampala.

UNION OF SOUTH AFRICA & SOUTHWEST AFRICA: Hubert Davies & Co., Ltd., Johannesburg, Bloemfontein, Welkom, Durban, East London, Port Elizabeth, and Capetown.

URUGUAY: General Electric, S. A., Montevideo.

VENEZUELA: International General Electric S. A., Inc., Caracas, Maracaibo, and Puerto La Cruz. (Excavators).
Sanchez & Cia., S. A., Caracas. (Water Well Drills).

VIETNAM: See French Union.

YUGOSLAVIA: Intercommerce, Belgrade.

Capacities Available

General Purpose Excavators and Cranes — ⅜ to 4 cubic yards (0.28 to 3.1 cubic meters) capacity.

Hydrocranes — 4-ton crane (3.6 metric ton); ⅜ cubic yard excavator (0.28 cubic meters). 9-ton crane (8.2 metric ton); ½ cubic yard excavator (0.38 cubic meters).

Quarry and Mine Shovels and Draglines — 2½ to 8 cubic yards (2 to 6 cubic meters) capacity.

Stripping Shovels — 2 to 65 cubic yards (1.5 to 49.7 cubic meters) capacity.

Blast Hole Drills (Cable Tool) for 6, 6⅝, 9, and 12 inch (150, 170, 230, and 305 millimeter) holes.

Blast Hole Drills (Rotary) for 6¾ to 9-in. holes (170 to 230 millimeters); for 9⅞ to 12¼-in. (250 to 310 millimeter) holes.

Walking Draglines — 4 to 33 cubic yards (3.1 to 25.2 cubic meters) capacity.

Railway Cranes — 160 and 250 ton (145 and 227 metric ton) capacity.

Water Well Drills for depths of 500, 1000, and 1500 feet (150, 305, and 455 meters).

Oil Well Drills for depths of 1500, 2500, 3500, and 6000 feet (455, 760, 1070, and 1830 meters).

65Y56C

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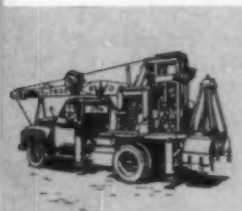
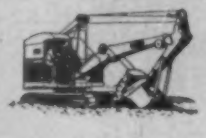


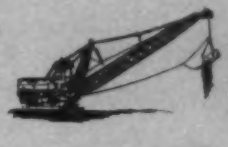
Hydrocranes



General Purpose Excavators

Railway Cranes

Blast Hole Drills



Walking Draglines

News from the Field

Bucyrus-Erie Appoints Black

Appointment of Lewis C. Black as sales manager, large machines, effective July 1 has been announced by Bucyrus-Erie Co., South Milwaukee, Wis. He will be responsible for all domestic sales of quarry and mine machines, walking draglines, stripping shovels and draglines and railway cranes.

Lewis C. Black

Black, a native of New Jersey, was graduated in 1935 from Lehigh University with a BS in mining engineering. He joined Bucyrus-Erie in 1935 as a special apprentice. In 1937, he was assigned to the Chicago office as a district representative for small machines. He was transferred to St. Louis in 1940. He became district representative for large machines in 1942 at Kansas City. He was transferred to New York in 1949 and became assistant Eastern District manager last October.

Restore Sunken Road

A short stretch of several hundred feet of pavement on the Ohio Turnpike in Williams County in northwestern Ohio which had settled several inches at a point where the highway was built across a peat swamp area has been restored to grade and is smooth and without bumps or sways, according to a report by R. J. Lehman, chief engineer for the Ohio Turnpike Commission, Columbus, Ohio.

"Mud-jacking" operations, which consist of forcing foundation material beneath the pavement by the use of pumps, were performed by the Commission's own maintenance forces to restore the pavement to grade, Lehman reported.

To forestall further settlement the Commission will employ a drilling contractor for the purpose of accomplishing necessary subsurface explorations and will employ a soils laboratory to perform tests.

Salt Lake Causeway

A giant conveyor system that will generate its own electrical power and set new speed records for material handling will soon be built to move 30 million tons of gravel from a Utah hill into the famous Great Salt Lake.

The gravel will be used in constructing a 13-mile roadbed for the Southern Pacific Railroad across the lake, replacing a 52-year-old trestle mounted on wood piles. The big earthmoving operation is scheduled to start next October and is expected to be completed in 26 months.

The conveyor system will be nearly two miles long and will handle the gravel at an average rate of 75,000 tons a day, a United States record for overland conveyors. When operating at full capacity, the rate can be increased to 90,000 tons, working three shifts totaling 21½ hours. The speed of the belts will be 800 fpm, exceeding usual belt speeds by 300 to 400 fpm. In terms of ton-miles per hour capacity, the system will far surpass in magnitude any belt conveyor system previously built. The material to be moved if piled on a baseball diamond would rise 14 miles into the stratosphere.

Even more unusual than high speed is the fact that the main part of the conveyor system will require little or no power from outside sources once it gets rolling. This is because the conveyors will coast downgrade from the gravel hill to the lake. The three motors attached to the three main conveyor units will function as a braking system to regulate the speed of descent. A special drive mechanism utilizing clutches attached to a drive pulley and a holdback pulley will be used to start the conveyor and control its speed. When power is required to drive the conveyor, the drive pulley is automatically engaged and the holdback pulley remains freewheeling. When the conveyor reaches full speed the holdback pulley takes over from the drive pulley and regulates the conveyor's descent.

The energy created by the gravitational glide will be converted into electrical power by the motors which in effect will become electrical generators. The wiring system will be arranged to capture this surplus power and feed it to three electric shovels to supplement the power required in digging the gravel out of the hill. Engineers estimate that the amount of surplus electricity generated by the three regenerative motors will be about 618,000 watts an hour, enough to meet the power requirements of about 4,000 average size homes. The drop in altitude from the gravel hill to the lake will be 400 feet.

The gravel will be put through a screening and crushing process to reduce all lumps to 8 inches or under before it is fed onto the 54-in. conveyor belts. After a downhill ride of a little less than two miles, the material will be transferred to a stacking conveyor which will build a storage pile 70 feet high. Under the pile will be two tunnels, a conveyor running through each one. These conveyors will be 72 inches wide and will have a combined capacity of 12,000 tons an hour, running at 550 fpm. The material will be fed to the tunnel conveyors by a series of overhead feeders to control the rate of flow to any tonnage desired. These conveyors

Continued on page 50

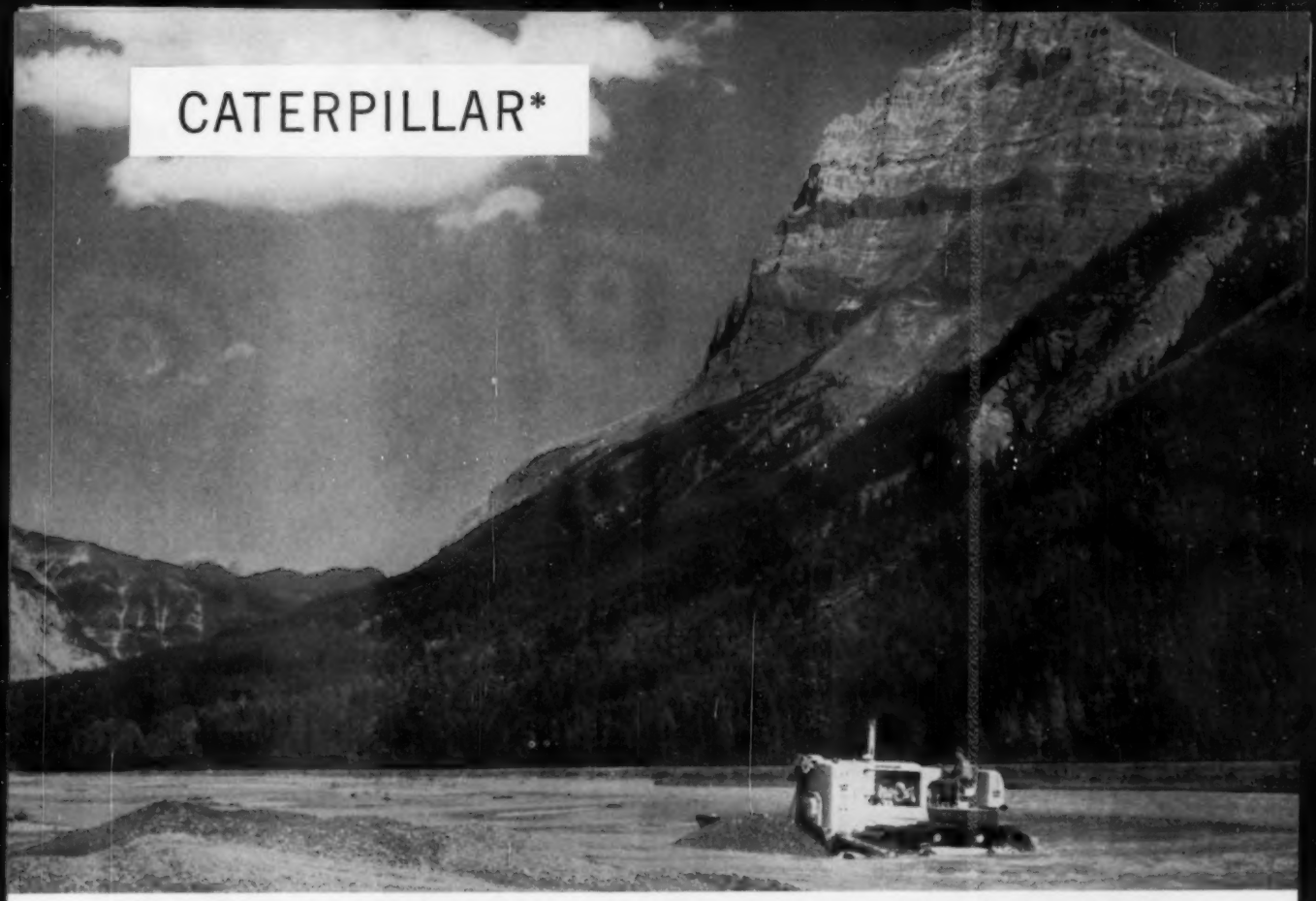
Franklin W. Zimmer

Franklin W. Zimmer, 49, sales manager of the Crane Div., Manitowoc Engineering Corp., died of a heart attack May 18 while golfing at the Elks Country Club in Manitowoc, Wis.

Mr. Zimmer joined Manitowoc Shipbuilding, Inc. in 1928. Before his appointment as sales manager of the crane division in 1952, he served as production manager and as assistant sales manager of the division.

Mr. Zimmer is survived by his wife and his mother.

CATERPILLAR*



IN BRITISH COLUMBIA, a D9 builds a dike to keep water from a borrow pit where it is push-loading DW21s on the Trans-Canada Highway construction. The owner, General Construction Co., Limited, Vancouver, reports, "This D9 push-loads 225 DW21s and Scrapers per day with river-run gravel." The D9 is equipped with a No. 9A Bulldozer.

IN JUST ONE YEAR, THE D9 WINS COMPLETE ACCEPTANCE

Across the continent, contractors make it standard equipment on tough jobs

Just one year after its introduction, the Caterpillar D9 Tractor—the biggest yellow machine of them all—is standard equipment in the construction industry. From British Columbia to Florida . . . from Massachusetts to California . . . on every conceivable type of job . . . enthusiastic reports roll in from satisfied contractors who have bought it. The exclusive Turbocharged engine of this Caterpillar giant is making the dirt fly on highway construction and relocation, on land clearing projects, dam and canal jobs, and at large building developments. Reports Minnesota contractor George W. Johnson, "Here is packaged power that we, of the construction industry, never have been offered before." Whatever the reason for this universal enthusiasm . . . power, ease of operation, simplicity of maintenance . . . one fact stands out. Never before has a piece of heavy equipment been accepted and put to use so quickly. CONTINUED

NEAR CHARLESTON, S. C., a D9 clears and 'dozes 150 acres in Bushy Park project to develop water sources on a $4½ million industrial site development. Over 3 million yards will be moved by owner, Robert E. Lee & Co. of Manning.

D9 ACCEPTED *(continued)*

BIGGEST TRACTOR PASSES ITS TEST BY FIRE

The first year in the field is always the most crucial for new equipment. Performance is watched closely and weighed carefully by veteran contractors. Here the D9 passes its first birthday with flying colors on widely different jobs across the nation . . . in soil conditions that include sand, peat, yellow and blue clay, decomposed granite, boulders, shale and gravel.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

IN MONTANA, a D9 push-loads a No. 90 Scraper on a U.S. Highway 93 project for its owner, Bud King Construction Company, Missoula, Montana. The 31-cu.-yd. (heaped, with sideboards) No. 90, pulled by a D8, is working in a 150,000-cu.-yd. cut near Florence, Montana.

NEAR IDAHO CITY, a D9 pioneers sidecuts, widening and relocating a 11.37-mile section of highway for Morrison-Knudsen Co. In rock and sand, the D9 is making 40 passes an hour, 14 ft. wide, 200 ft. long.

IN STRAWBERRY, CALIF., a D9 builds a 4-mile access road to Beardsley Dam site. The owners, Tri-Dam Constructors of Strawberry, are roughing out this road in 60 days. Soil is decomposed granite and boulders.

IN PARAMUS, N. J., building a shopping center, a D9 'dozes shale and clay to help load scrapers quickly for Sam Braen Construction Co., Wyckoff, N.J. After 'dozing, the D9 push-loads two CAT* DW21s in less than 60 seconds.

IN MINNESOTA, this D9 singlehandedly reduces this cut (450 ft. long by 150 ft. wide) to 8% grade for its owner, Johnson Construction Co., Grove City. The D9 handles 10 to 15 yards a pass on the cut involving 237,000 yd. of fine sand, blue and yellow clay. Job is relocation and widening of U.S. Highway 16.

News . . .

Continued from page 46

will carry the material about 250 feet to the edge of the lake and dump it into barges, of which there will be seven shuttling back and forth between the discharge point of the conveyors and the new roadbed to be built parallel to the present trestle.

The Southern Pacific Railroad has announced that the new roadbed is scheduled to be ready to carry rail traffic by 1960. The total cost of the project, including dredging, filling and construction of the railroad across the lake, is expected to run around $49 million. The conveyor system will cost over $1.7 million. The Morrison-Knudsen Co., Boise (Idaho) contracting firm, has been awarded a contract by Southern Pacific to do the major part of the work. Hewitt-Robins, Inc., New York, N. Y., has received the contract for designing and building the conveyor system from Morrison-Knudsen.

Elect NHUC Chairman

William S. Richardson, president of The B. F. Goodrich Co., Akron, Ohio, recently was elected chairman of the National Highway Users Conference, succeeding Albert Bradley, chairman of the board of General Motors Corp. Bradley had served as NHUC chairman since 1948.

Prentiss Takes Over ARBA

Maj. Gen. Louis W. Prentiss (USA Ret.) assumed his duties as executive vice president of the American Road Builders' Association May 1.

Prentiss, who succeeds Gen. Eugene Reybold (USA Ret.) as ARBA's executive head, has a background of over 35 years of military service. He is 56 years of age and a native of the District of Columbia.

He studied engineering at the Colorado School of Mines and entered the army as a second lieutenant, field artillery, in 1921. After eight years of regular army service, he transferred to the Corps of Engineers, where he has held important posts.

Prentiss became widely known after his appointment as Engineer-Commissioner of the District of Columbia in 1952. He was promoted to major general by President Eisenhower in 1954 and was selected to take over command of the Engineer Center at Ft. Belvoir, Va. He served in that post until his recent retirement.

Stamp Features Scraper

A stamp featuring an earthmover has been issued by the French Post and Telecommunication Administration.

The stamp shows a scraper—a Le Tourneau-Westinghouse of the type pictured beneath the stamp reproduction—at work on a new road to link the settlement of Abengourou with the port of Abidjan in the Ivory Coast territory of French West Africa. A fleet of the scrapers was used on the project.

Stuart Duncan

Stuart Duncan, 72, chairman of the board of Marquette Cement Manufacturing Co. and president of the LaSalle State Bank, LaSalle, Ill., died May 24.

Mr. Duncan, who was the son of one of the founders of the cement manufacturing firm, began his career as assistant treasurer for Marquette in 1906, became a director of the company in 1915, and chairman of the board in 1933. He had also been president of the LaSalle State Bank since 1927.

Mr. Duncan was a graduate of Niagara University and a life-time resident of LaSalle. He had long been prominent in the civic and charitable affairs of the area. He was past Grand Knight of Calvert Council, Knights of Columbus, and former Exalted Ruler of the LaSalle Elks Lodge.

He is survived by five sons and one daughter, Mrs. Helen Duncan Haskins of LaSalle, Ill. His sons are John Duncan, LaSalle banker; Paul Duncan, assistant secretary and assistant treasurer of Marquette Cement; Thomas Duncan, attorney of Fairfield, Ill.; Dr. Robert Duncan, LaSalle physician; and Father David Duncan, who is an instructor at St. Bede's College, Peru, Ill.

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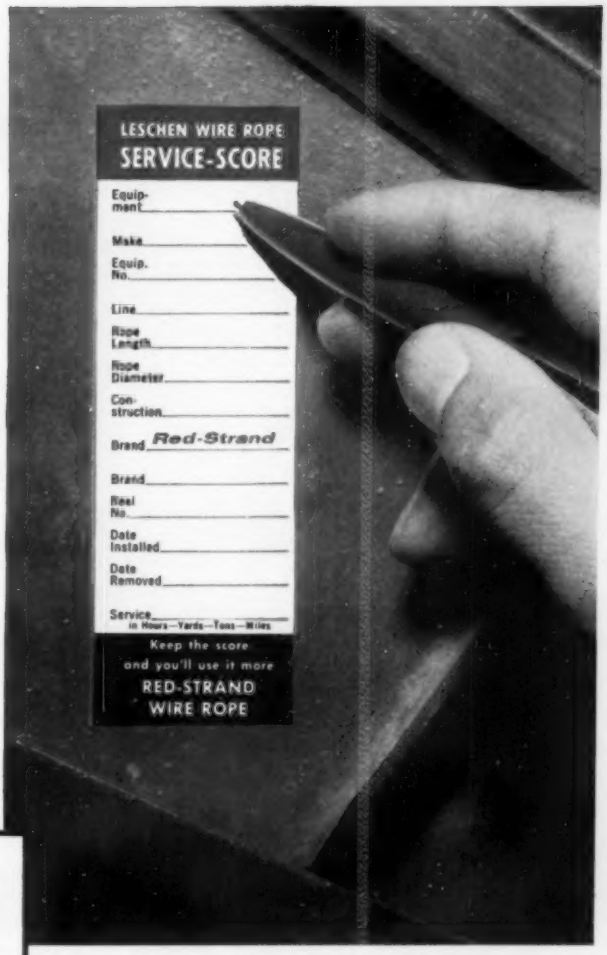
NEW WIRE ROPE Service-Score SYSTEM

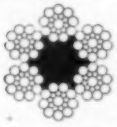


Simple plan tests wire rope performance and costs—shows comparative values—helps reduce operating expenses—speeds reordering.

Leschen's quick-fact-finding Service-Score System utilizes easily applied, easily removed pressure sensitive stickers, which record equipment and rope data, dates of rope installation and removal.

What is your *true* wire rope cost? Do you know? Are you using the right rope type or construction? The right brand?

Questions like these are readily answered with Leschen's new Wire Rope Service-Score System.



Service-Score stickers report performance—type versus type, brand versus brand. Performance facts reveal costs and help *cut costs.*

Service-Score stickers provide easily-available, *helpful reordering data*—equipment identification, wire rope diameter, length, construction, date installed, and date removed.

Service-Score stickers remind operators when it's time to replace rope—*increasing safety* margins.

Service-Score records enable you to check and compare wire rope types and constructions. For example, you find for yourself, as others have, that Red-Strand consistently scores high. You learn the advantages of super-strength Porter Imperial Red-Strand, or Hercules Flattened Strand.

Write for sample stickers. Or see your nearby Leschen Wire Rope distributor.

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WIRE ROPE

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LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.
St. Louis 12, Missouri

A DIVISION OF HKP H. K. PORTER COMPANY, INC.

Equipment You Ought to Know About

Caterpillar Attachments

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: Caterpillar has announced new attachments for some of its equipment.

One of the attachments is an auxiliary seat attachment (below) for D9 and D8 tractors. The seat, designed to provide a convenient and safe means of

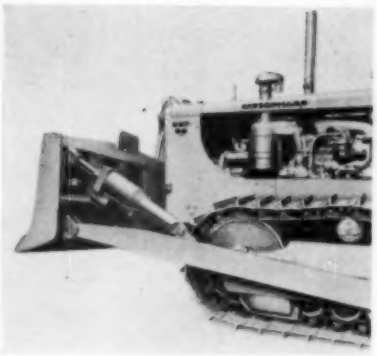
transportation for a helper or other personnel, mounts on the deck of the tractor.

The cushions and backrest are padded with foam rubber. The seat is upholstered in scuff and water-resistant synthetic material. The cushion can be tipped easily to prevent the accumulation of moisture when the tractor is not in use.

The seat is not adaptable for use on D9 tractors equipped with cabs.

A hydraulically actuated bulldozer tilting attachment (at top) is available for use with No. 9S and 8S bulldozers. The attachment is designed to give D8 and D9 tractors increased versatility on such jobs as ditching, pioneering roads on hillsides, digging rocks and other applications which require frequent blade tilting.

A large hydraulic cylinder which replaces the left bulldozer blade brace is the heart of the tilting attachment. With the right-hand brace adjusted to its neutral position, either corner of the No. 9S blade can be raised approximately 28 inches above ground level by retracting or extending the tilt cylinder. The blade can be raised approximately 24 inches on the No. 8S.

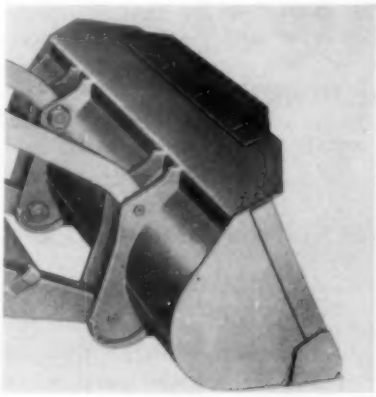


Additional tilt can be obtained by extending or retracting the screw-type right-hand brace. New bulldozer trunnions, designed to take full advantage of the maximum tilt, are furnished with all new No. 9S and 8S bulldozers.

The tilt cylinder is controlled from the operator's seat by means of a front-mounted No. 44 hydraulic control or the new rear-mounted No. 48 hydraulic control. The No. 48 hydraulic control has an output of 42 gpm at 1,412 rpm at 1,000 psi. The hydraulic pump is mounted on and driven by the engine rear power take-off. The control valve is enclosed in the tank which is mounted separately on the rear of the tractor.

The No. 48 hydraulic control also is used to operate the No. 8 ripper. A double valve arrangement is available for combined operation of the No. 8 ripper and the No. 8S bulldozer hydraulic tilt cylinder attachment.

A new bucket spill plate attachment (below) is available for No. 977, No. 955 and No. 933 Traxcavators. Designed to make full use of the machines' power and bucket actions, the new attachment makes it possible to get heaped loads without excessive spillage even when working in loose, friable material.



The attachment is bolted on to the top edge of the bucket. It is adjustable and can be extended from 2½ to 5 inches above the bucket spill plate.

Bucyrus-Erie Dragline Buckets

Manufacturer: Bucyrus-Erie Co., South Milwaukee, Wis.

Claims: Bucyrus-Erie has announced a line of completely new dragline buckets offered with either solid or perforated baskets.

Three types are available in a wide range of sizes—the BL for light-duty digging in materials with resistance to penetration similar to that of loose gravel or clay; the BM for medium-duty

digging in bulky material with penetration similar to light shale or cemented gravel; and the BH for heavy-duty digging conditions.

According to the manufacturer, the new dragline buckets are strong, yet far lighter than those previously offered. They are made of Becoloy, a special steel alloy developed by company metallurgists specifically for dragline bucket service. Its strength and tough, fibrous structure provide high impact resistance, even at low temperatures.

Among features of the new bucket line are: high arch of bucket, which provides wide opening and ample clearance for easy loading and dumping; "slicing action" lip—a thin Becoloy cast steel section which is properly shaped for most effective penetration; solid or two-part Becoloy teeth, hardened for maximum wear; tapered basket scientifically shaped to load full and fast and to dump quick and clean; and a free-rolling dump block equipped

Continued on page 56

Preferred for Dependable 'Round-the-Clock Pit Operation

Built-in economy that assures low maintenance, long machine-life, and sustained high output — that's why Bucyrus-Eries are preferred in the pits. It's a combination that's tough to beat for typical long range work . . . the result of Bucyrus-Erie's constant close attention — during manufacture — to the little things that mean outstanding quality.

Take the triple-tested steels that go into Bucyrus-Eries, for example. Hammer forging, annealing, heat treating, case hardening, flame hardening, and stress-relieving processes are applied — each where it contributes most to strength, toughness, and hardness. The most modern arc welding methods are used to produce highest quality fabricated parts.

Skilled manufacturing is only one of many Bucyrus-Erie quality features that add up to more actual working time each shift — and to greater output and profit. You get top quality design, too: easy adjustments and accessibility speed maintenance . . . balanced, smooth digging cycles mean no overstressing of any parts . . . and conveniently grouped, easily manipulated controls add to digging time by cutting waste motion and reducing operator fatigue. For complete information on Bucyrus-Erie shovels and draglines from ⅜- to 4-yd. capacity, see your Bucyrus-Erie distributor today. For information on larger sizes, write us direct.

214E56C

Bonus Quality *saves you money*

Skilled chemists and physicists in the company's own metallurgical laboratory regularly study new materials, alloys, and treating processes to determine their suitability for application to Bucyrus-Erie machines. Here a laboratory technician burns chips from a foundry test bar to determine carbon content of the steel. Each heat is triple-tested to ensure meeting specifications.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

more yards per load

Gets More

A combination of powerful "pry-out" action using breakout pads as a fulcrum for leverage and a 40° bucket tip-back *at ground level* gets BIGGER LOADS with less spillage.

Keeps More

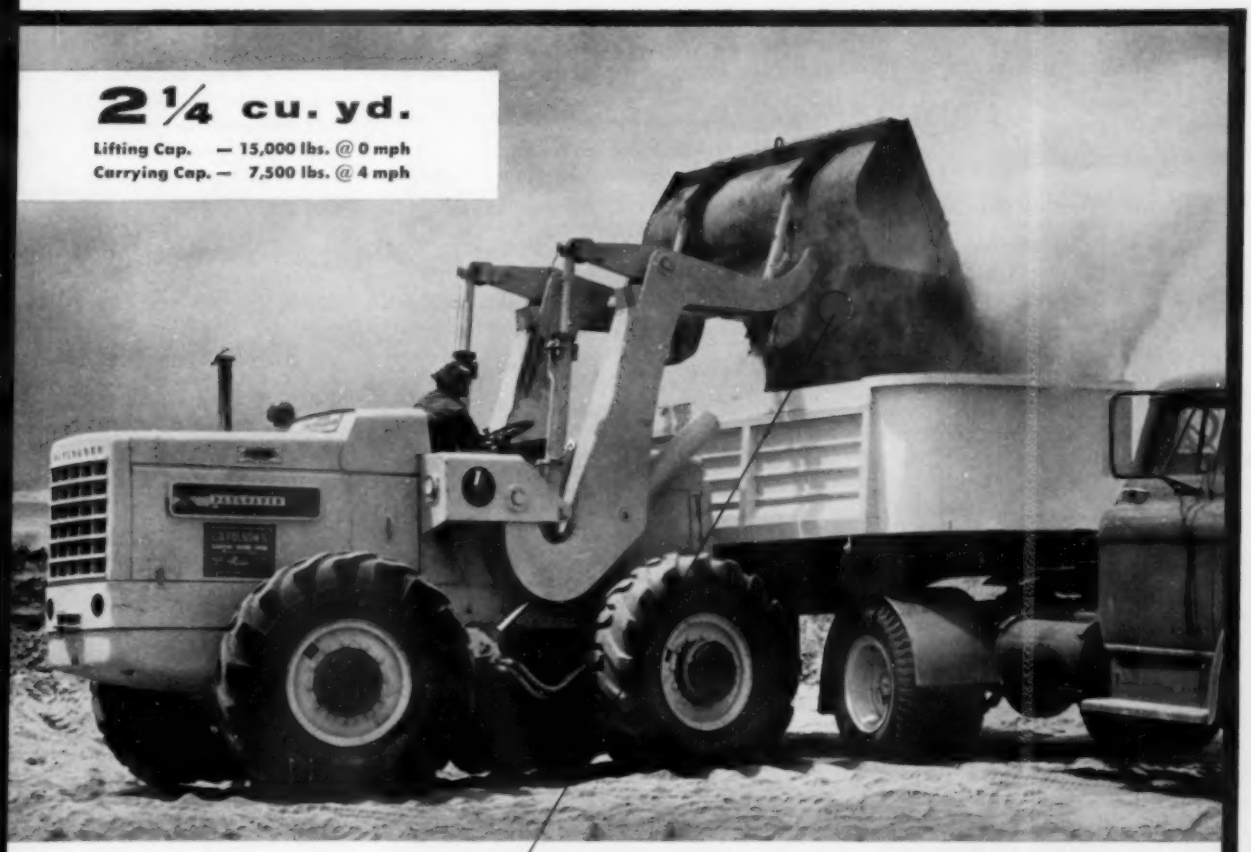
Heaped loads are cradled closer and lower for greater stability while carrying. Hydraulic system shock-absorber also cushions the load, smooths the ride, and permits faster movement with less spillage.

Delivers More

Since you get MORE to begin with and keep MORE while traveling at higher speeds . . . with less spillage in both instances . . . the result — you *deliver* more yards per load and more loads per hour.

The new model HO is the finest four-wheel-drive tractor-shovel ever offered. It has *everything* that has proven desirable in modern tractor-shovel design, including important new and exclusive features: torque-proportioning differentials; no-stop power-shift transmission; powerful 40-degree bucket break-out action; "stay-clean" hydraulic system; greater dumping height and reach; longer wheelbase; shorter length while carrying.

This big "PAYLOADER" operates easier and faster and rides smoother, with or without a load, than anything near its size. It has *balanced* design and durability throughout to turn out big production day after day. If you want proof of its *productive capacity* and superior *performance,* ask your "PAYLOADER" Distributor for a demonstration.



more loads per hour

Loaded with "more-yardage" features

- **Torque proportioning differentials** — an exclusive "PAYLOADER" feature—increase effective traction. If one wheel begins to spin because of poor traction, more power is delivered automatically to the other wheel.
- **"No-stop" power-shift transmission,** with torque-converter, can make ALL shifts on-the-go under full engine speed. There's no stopping for a range shift and no "clutching". Operator can "inch" the machine with forward-reverse control while maintaining full engine speed to provide maximum bucket lifting and dumping power.
- **All-power control** also includes power brakes on all wheels, and power steer to further reduce operational fatigue and promote full production all day.
- **Rugged planetary final drives** in all wheels, plus hypoid differential gearing keep torque low in axles—prolong life of drive train parts as well as axles.

Safety and Stability

The safest and most stable wheeled tractor-shovel ever built. Moving members cannot injure operator because of underslung boom arm design and positioning. With loads carried lower and closer to the machine, cushioned during travel, and with longer wheel-base the utmost in stability is achieved.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
708 Sunnyside Ave., Libertyville, Ill.

Send information on "PAYLOADER" tractor-shovels:

☐ model HO — 2¼ cu. yd. heaped, 1¾ cu. yd. struck
☐ model HH — 1¾ cu. yd. heaped, 1½ cu. yd. struck
☐ model HU — 1 cu. yd. heaped, ¾ cu. yd. struck

Name_____
Title_____
Company_____
Street_____
City_____ State_____

New Equipment . . .

Continued from page 52

with sealed tapered roller bearings for smooth, fast operation and long rope life.

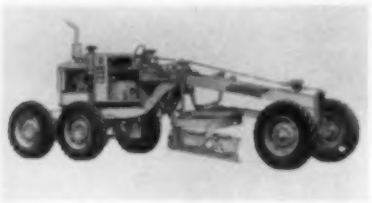
LeTourneau-Westinghouse Grader

Manufacturer: LeTourneau-Westinghouse Co., Peoria, Ill.

Claims: LeTourneau-Westinghouse's new motor grader—the Adams 220—is powered by a 60-hp diesel engine. The grader weighs 14,865 pounds.

Designed primarily for general grading and road maintenance, the 220 is capable of handling the same types of work as the larger Adams models at a production rate in proportion to its weight and power.

One of the new features in the 220 is a teaming of hydraulics and mechanics in hydra-power gear system which powers both lift and lateral shift of the blade. The gear system employs hydraulic power for ease of operation and



mechanical torque for speed and positive action. It uses gears to convert the thrust of hydraulic rams to mechanical turning power.

The gears provide a 3 to 1 multiplication.

The blade of the 220 can be moved from a ditching position to full vertical bank cutting on either side in one continuous movement without indexing and re-indexing.

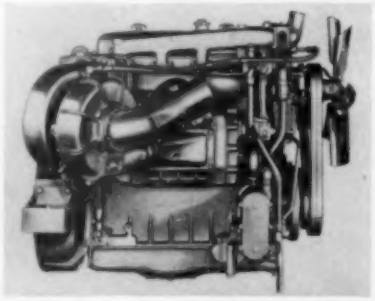
The new grader provides a broad range of standard operating speeds, plus additional extra-slow rates through optional creeper gears. The standard sliding-gear transmission provides five forward speeds from 1.8 to 18.3 mph. The optional creeper gears add four more speeds from .28 to .96 mph for finish-grading in tight places, tough rooting jobs and other difficult applications where it might otherwise require slipping the clutch or reducing engine power to permit the necessary slow operation.

Other features include a hydraulic-mechanical circle reverse mechanism which revolves the blade under the scarifier block to any angle within a full 360°; power-controlled leaning front wheels; and hydraulic brakes on front tandem drive wheels with mechanical parking brake on transmission.

The 220's specifications list its length as 22 feet 9 inches and its width as 7 feet 3 inches. The 60-hp diesel power plant is a 2-cycle General Motors 4-51.

Optional equipment includes 10 and 12-ft. power-shift and 12-ft. slide shift moldboards, 9-tooth scarifier, creeper gears, and a top—with or without enclosure.

Detroit Diesel Additions



Manufacturer: Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.

Claims: Detroit Diesel has announced three Turbopower engines as additions to its Series 71 line of industrial two-cycle diesels. Available are four and six-cylinder fan-to-flywheel engines and a six-cylinder base-mounted power take-off unit.

All features of the Series 71 engine have been retained in the new additions. A single-shaft, exhaust-driven turbine and air impeller have been added.

The four-cylinder engine (pictured) has a rating of 171 basic horsepower at 2,300 rpm. The "Six" is rated at 236 basic horsepower at 2,100 rpm. These engines are suited for use as replacement power in on and off-the-highway trucks. Both fan-to-flywheel engines weigh approximately 9½ pounds per horsepower.

Increased horsepower and better efficiency at all engine loads are attained in the new units through improved combustion with no increase in fuel input. An exhaust-driven turbine and air impeller team up with the engine-driven blower to increase the scavenging air supply and the pressure at which it is delivered to the cylinders. This results in higher air-to-fuel ratios, which contribute to increased horsepower and fuel economy.

Horsepower is further increased because the air impeller supplementing the air supply to the cylinders helps reduce the amount of horsepower required to operate the engine-driven blower.

Changes have been made in the cylinders of Turbopower engines to handle the increased air supply and the corresponding increase in exhaust gases. The air-intake ports are larger and extend to a higher level on the cylinder liners. This permits a greater charge of air to enter the cylinders and allows the ports to remain open for longer air-intake periods.

A fast and complete discharge of exhaust gases in Turbopower engines has been attained by increasing the number of exhaust valves in each cylinder from two to four. As in Series 71 engines, the valves are activated by rocker arms on the head, but each rocker arm activates two valves. This is accomplished by a bridge piloted on a vertical shaft screwed into the cylinder head. The bridge is adjusted to contact each valve equally. The valve lash is accomplished as in non-turbopowered Series 71 engines.

The Turbopower units do not replace any existing models in the Detroit Diesel line.

⅜-Yd. Erie Clam

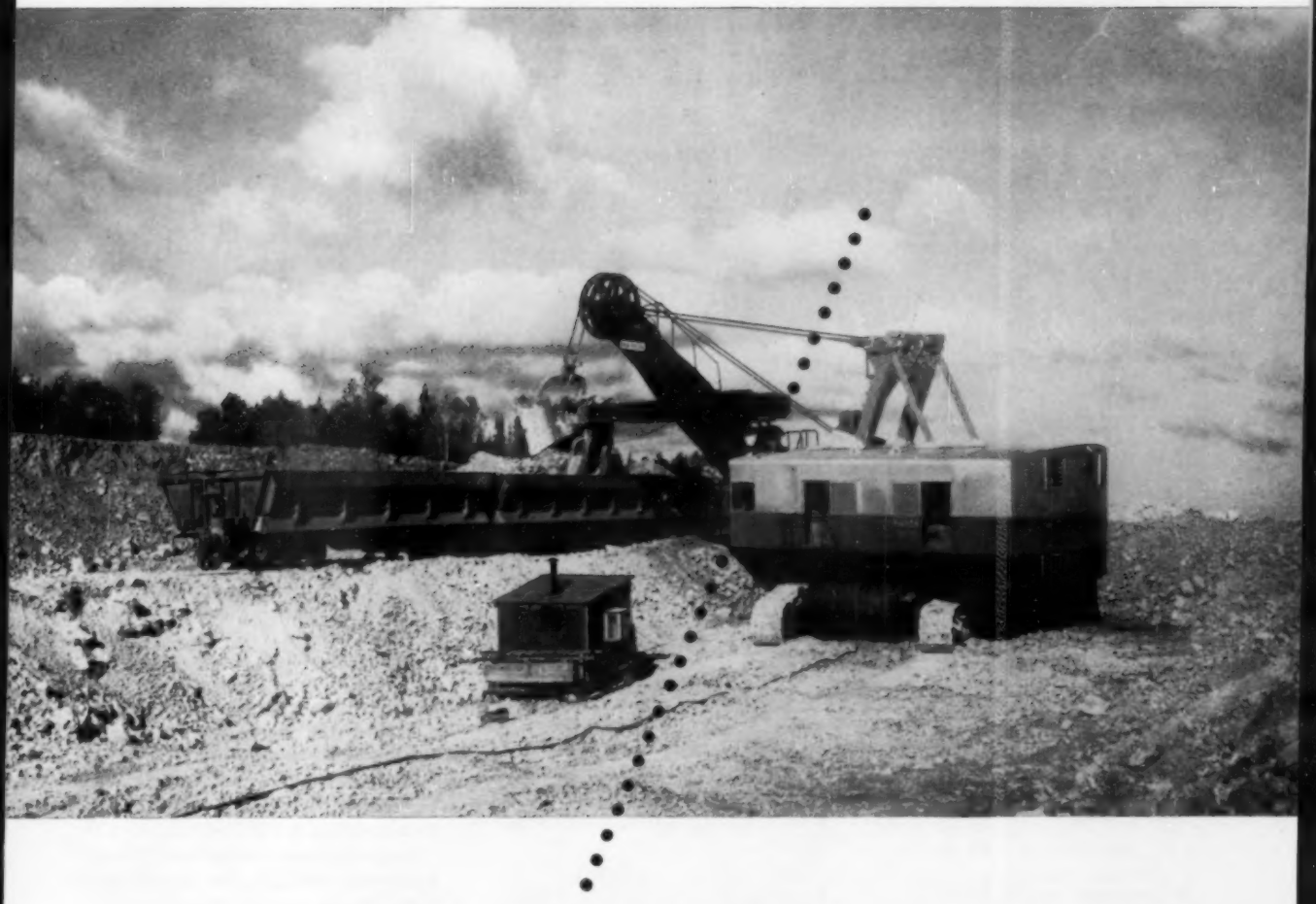
Manufacturer: Erie Strayer Co., Geist Rd., Erie, Pa.

Claims: A ⅜-yd. extra light rehandler is the latest addition to Erie's clamshell bucket line. Called the XLR-38, the bucket is designed especially for 6 to 12-ton equipment.

The model has all the design and construction features of the Erie line, including: block and tackle and lever

Continued on page 58

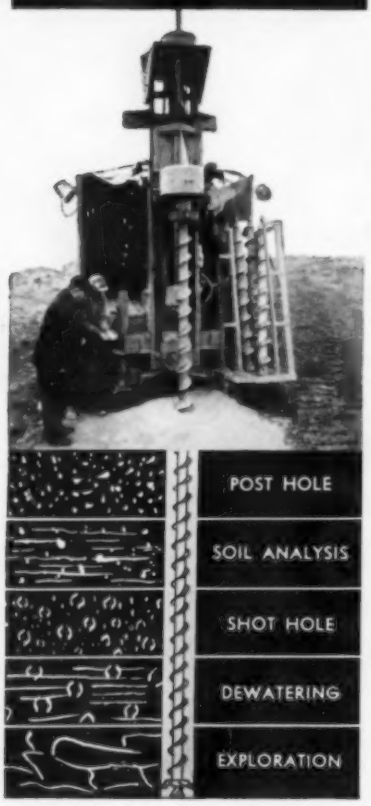
WORLD'S BIGGEST LOADING SHOVEL



This 10 cubic yard Marion 191-M is the world's largest shovel on two crawlers. It is teaming up with big haulage units to establish new concepts of production in several industries. Here the 191-M loads 90-ton rail cars in the pits of one of the midwest's great producers of limestone.

MARION POWER SHOVEL CO. • MARION, OHIO

DEEPER, FASTER
McCARTHY NEW HEAVY-DUTY
VERTICAL AUGER DRILLS



AUGER DIAMETER	DEPTH OF BORE
20" and 24"	16' to 30'
12" and 16"	60' to 70'

for drilling in earth, clay, compacted sand and gravel, and soft shale formations.

3", 4½", 6", 8" and 9"	up to 125'

for drilling the above, plus drilling in hard sandstone formations.

Choose the most desired size auger for each drilling depth, in any vertical drilling operation. The new McCarthy Model 106-24 Vertical Auger Drill handles augers from 3" to 24" in diameter.

Adjust drilling speed properly for various rock and earth formations. Model 106-24 has two output shafts, one speed for earth and one for rock. A gear reducer slows auger rotation for harder rock formations. This gives more torque, or "biting power" in sand rock and soft limestone.

Write for Bulletin M-100

THE SALEM TOOL CO.
799 SOUTH ELLSWORTH AVE.
SALEM, OHIO, U. S. A.

New Equipment . . .

Continued from page 56

arm action; rigid, one-piece welded head; and continuous wrap-around reeving.

The XLR-38 can be had with or without teeth and counterweights.

The XLR-38 brings to seven the number of clamshell buckets now in the Erie line.

New IH Off-Highway Trucks

Manufacturer: International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.

Claims: International Harvester has introduced two off-highway rear-dump trucks to its line of heavy-duty construction equipment. The new Payhauler trucks feature high speed, exceptional power-to-weight ratio, and unusual climbing ability for construction, mining and quarrying work. The Model 95 Payhauler is rated at 24 tons or 16 cubic yards struck capacity. The Model 65 Payhauler has a capacity of 18 tons or 12 cubic yards struck.

The Model 95 Payhauler is powered by a Cummins turbo-charged diesel engine developing 335 horsepower at 2,100 rpm. The Model 65 Payhauler is powered by a Cummins turbo-charged diesel engine developing 250 horsepower at 2,100 rpm.

The Payhaulers have high top speeds. The Model 65, with either the 5 or 10-speed transmission, and air assisted master clutch, can roll along at 36½ mph. The Model 95 has a top speed of 37.2 mph when equipped with a standard 9-speed transmission and a top speed of 38 mph with a torque converter and power shift transmission.

Overall dimensions of the Model 95 are 13-ft. 9-in. wheelbase; 26-ft. 1-in. overall length; 11-ft. 6-in. overall width; and 9-ft. 2-in. loading height. Turning radius is 30 feet 5 inches. Empty weight with quarry body equipped with torque converter is 47,980 pounds; with 9-speed transmission, 46,610 pounds. With a standard body equipped with torque converter transmission, weight is 48,820 pounds; with 9-speed transmission, 46,850 pounds.

The Model 65 has a 13-ft. 2-in. wheelbase; 24-ft. 11-in. overall length; 11-ft. overall height; 10-ft. 8-in. overall width; and 9-ft. loading height. Clearance under the front axle is 15 inches; clearance under drive axle is 14⅝ inches. Turning radius is 29 feet 3 inches. Empty weight with quarry body equipped with a 5-speed transmission is 39,865 pounds; with a 10-speed transmission, 40,160 pounds.

A large radiator with 1,425 square inches of area, plus a powerful 32-in. fan provides cooling on both Models 65 and 95. In torque converter models, heat problems are eliminated by using a large capacity built-in heat exchanger. In models equipped with conventional transmissions, cerametallic clutch facings eliminate overheating. The Payhauler bodies provide four different styles to meet all hauling duties. The Model 65 can be equipped with a quarry body; the Model 95 with a standard body, a quarry body or an exhaust-heated body.

Hydraulic double-action hoists raise the body quickly. The chute-type body swings down behind and below the rear wheel, dropping load completely over the edge or rim of hopper. Bodies are designed to shed the toughest materials. The dumping angle is 65°. Lifting speed to maximum raised position in the Model 65 is 7.5 seconds and in the Model 95 is 9.1 seconds.

Both Payhauler models have 125-gal. fuel tanks. Both models are equipped with tubeless tires.

The driver's cab of the new Payhauler has a spacious leather-covered, fully adjustable seat. Jars and jolts are reduced through compression-spring hydraulic shock absorbers. Full-time power steering is provided. A two-piece windshield provides excellent vision ahead and to both sides. The offset cab design gives unobstructed view to the rear.

Koehring ¾-yd. Excavator

Manufacturer: Koehring Co., Milwaukee 16, Wis.

Claims: Koehring is producing an excavator in the ¾-yd. class which is similar in basic design to the firm's new ½ and 1-yd. machines.

The ¾-yd. machine, known as the Model 305, has a rated lift crane ca-

pacity of 25 tons on truck chassis and 15 tons on crawler mounting. It can be equipped with a full complement of attachments.

The upper machinery of the Model 305 has been simplified to contain only two major horizontal shafts. The all-welded turntable is equipped with integral sidestands. Main cross shafts revolve in antifriction bearings.

Features of the 305 include self-cleaning crawlers, automatic traction brakes, a newly designed cab and operating lever arrangement and a mechanical cam-type booster clutch on the main drum clutches.

The hoe attachment for the 305 provides a digging depth of 20 feet. The hoe dipper pulls tight to the boom. Side cutters are used.

Stronger Leschen Rope

Manufacturer: Leschen Wire Rope Div., H. K. Porter Co., Inc., 2727 Hamilton Ave., St. Louis 12, Mo.

Claims: Leschen has announced an extra high strength grade of Flattened Strand Wire Rope, 15% stronger than the previous. The completion of production arrangements for this extra strength product in the Flattened Strand construction rounds out the use of this higher strength steel in all steel core fabrications of Leschen wire rope. Round strand ropes have been available in the new grade for some time. The stronger grade will be called Porter Imperial Red-Strand Wire Rope. All ropes of this quality will be fabricated with steel cores.

Leschen has made a specialty of the Flattened Strand construction for many years.

The additional strength offers many advantages. Greater than normal temporary loads can be handled without having to install a larger rope. Also on jobs where unexpectedly encountered shock loads may create a great strain momentarily, the extra strength of

Continued on page 63

BITES DEEPER DUMPS FASTER

PROMPT SERVICE AVAILABLE

Factory service on Kiesler Buckets and as an accommodation on other makes, too. Whatever the problem, feel free to call on us.

Whether you need to rehandle or excavate, you will move MORE IN LESS TIME with a KIESLER CLAM SHELL. Our guarantee (see below) is the result of decades of experimentation and factual impartial testing; using *proven* principles of leverage and power and applying that power and leverage to *both* shells the KIESLER CLAM SHELL has more DIGGING-IN ability than any other bucket manufactured. And this digging ability is not dependent on dead weight (counterweights) nor large amounts of cable, hence longer cable life.

Note, too, how little KIESLER shells have to be opened to dump whole load: no "tailing-off" with a KIESLER. This is CONTROLLED DUMPING!

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F. KIESLER CO.

KIESLER Since 1892

944 W. HURON ST. • CHICAGO 22, ILL. • MONROE 6-7144

NOT in the Contract

A drunk in a hotel repeatedly called the phone operator in the early a.m. as to when the bar opened. Each time she said "eleven o'clock."

Finally, the manager was asked to take the call and he said, "eleven o'clock, but I'm going to be there to see that you don't get in."

Whereupon the drunk replied, "I don't want in. I want out."

Hotel Guest (phoning at late hour): "Is this the desk clerk?"

Ill-humored clerk: "Well, what's eating you now?"

Guest: "That's what I'd like to know."

The great novelist had gone insane but now there appeared to be some hope for his recovery. For three months he had been sitting at a typewriter in his room and pounding out a novel. At last he announced it was completed and brought it to a leading psychiatrist at the institution who grasped it eagerly and began to read.

"General Jones leaped upon his faithful horse and yelled giddap giddap, giddap, giddap, giddap." Then the doctor thumbed through the rest of the book. "Why there's nothing here but five hundred pages of giddaps," he exclaimed. "Yeah," said the writer. "Stubborn horse."

"I'm descended from a long line of Boston bluebloods."

"And I'm descended from a long line my mother once listened to."

W. C. Fields was once asked if he believed in clubs for women. "Yes," he replied, "but only if every other form of persuasion fails."

"Is Frank a confirmed bachelor?"

"He is now. He sent his picture to a lonely hearts club and they sent it back with a note saying, 'We're not that lonely'."

"Pardon me, 'Mr. President,' but we'd like to use that blast hole now . . ."

"On the day on which my wedding occurred . . . ," Jones began.

"You'll pardon the correction," interrupted his companion, "but affairs such as marriages, receptions, dinners and things of that sort 'take place'. It is only calamities which 'occur'. You see the distinction?"

"Yes, I see," replied Jones. "Well, as I was saying, on the day on which my wedding occurred. . . . "

On his way home a drunk stopped at a lamp post and pulled out his house key.

A passing policeman noticed his fumbling around, trying to insert the key into the post, and said politely: "Nobody home?"

"You're crazy," said the drunk, "There's a light on upstairs."

First Angel: "How did you get here?"
Second Angel: "Flu."

A patient believed that all his trouble was due to a cat in his stomach. The feline, he told doctors, scampered around inside and caused no end of agony and discomfort.

One day, he really became ill—appendicitis. While operating, the surgeon came up with an idea to put an end to the cat business. He sent out for a black tomcat. When the patient awoke after the operation, the surgeon proudly held up the wide-eyed cat and said: "Your troubles are all over now. Look what we took out of you."

The patient hugged his stomach and moaned, "Dopes, you got the wrong cat. The one that's been bothering me is a white one!"

Mr. Jones was skipping down the street whistling a gay tune. His neighbor, falling in step with him, remarked, "You're pretty happy this morning."

"Right you are," grinned Mr. Jones. "I just cured my wife of yelling at me all the time."

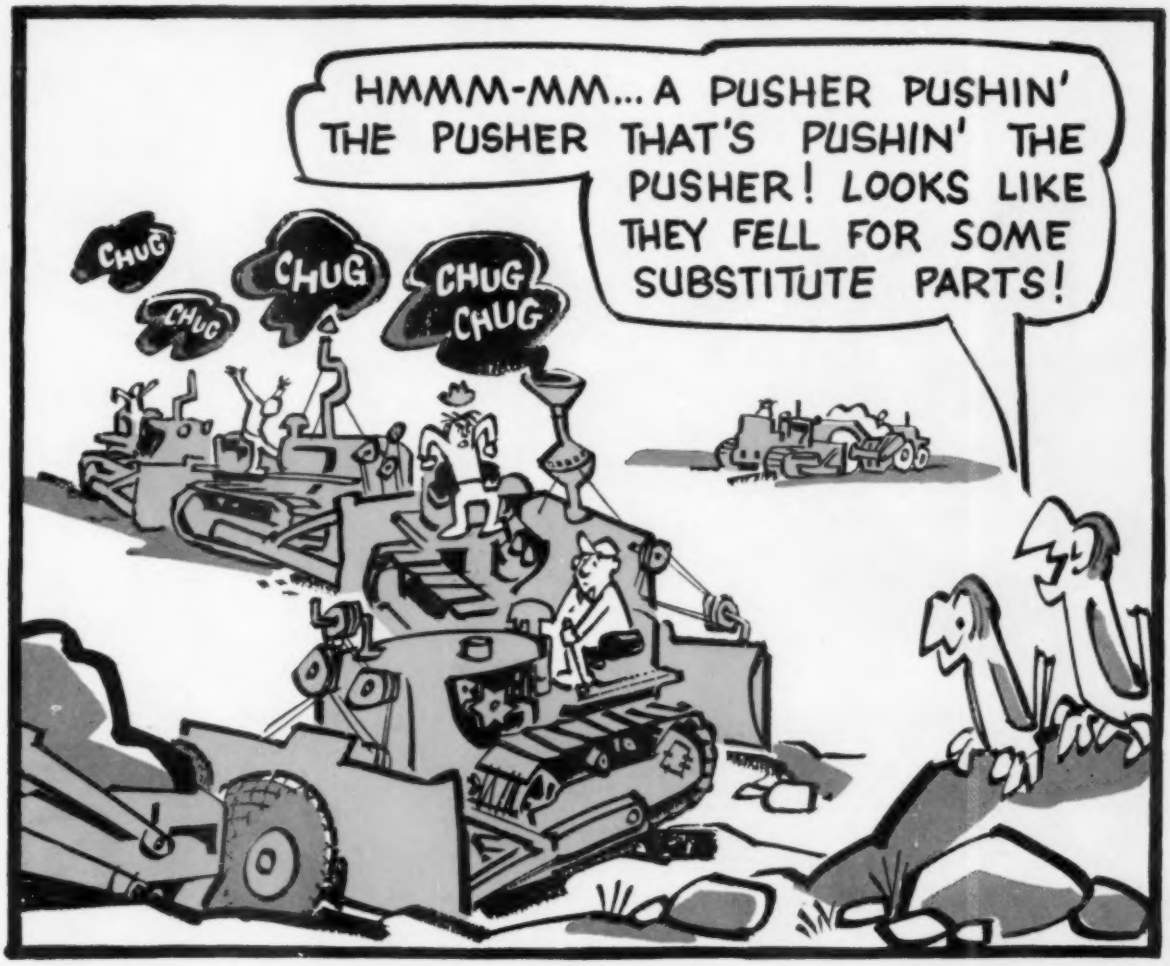
"Well, well. How did you do it?"

"I convinced her that it was making a nervous wreck out of the dog."

And then there's the Texas yarn about the woman who called her husband and asked:

"Will you get the car out, Tex, and drive the kids to the backyard so they can play?"

There are two well-known finishes for automobiles: lacquer and liquor.



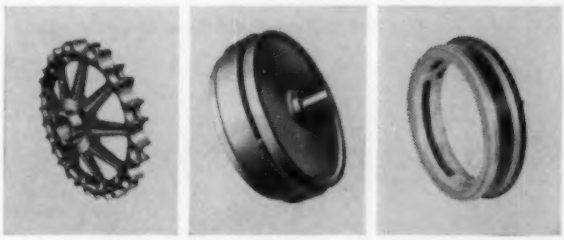
Anybody ever tell you there's no difference in parts?

Take sprockets, for example. Caterpillar *original* sprockets feature *deep-hardened teeth* with tough cores to withstand shock loads. CAT* original idlers have steel disc construction, with steel treads *flame-hardened* for greater wear. Cat bellows seals are of self-aligning face-type design. They help keep lubricant in and dirt out, even on the dustiest job. You're *sure* of new machine performance with original parts like these.

With substitute parts, can you be sure of anything?

Better see your Caterpillar Dealer's Parts Representative—and get Cat original parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.



Caterpillar sprockets, idlers and seals are the result of over 50 years of track-type tractor manufacture. So don't be fooled—there is a difference in parts. Why take chances with substitutes?

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

This Bucyrus-Erie 1050-B stripping shovel is stripping overburden in an Ohio mine.

Familiar answer to an old problem...

BUCYRUS ERIE

SOUTH MILWAUKEE
WISCONSIN

As overburden goes deeper and deeper, the need becomes greater and greater for stripping methods that will hold costs down to reasonable levels. An effective and familiar answer to the problem is a Bucyrus-Erie stripping shovel such as this 1050-B.

These machines are capable of moving really big yardages at low cost per yard. They have the long working range and time-saving maneuverability to work effectively. Just as important, the simple, field-proved design helps keep operating expense and maintenance to a minimum.

If you're looking for a solution to the problem of rising stripping costs, check into the economical advantages that Bucyrus-Erie stripping shovels and draglines can bring you. Bucyrus-Erie builds these machines in capacities up to 65 cu. yd.

79156C

New Equipment . . .

Continued from page 59

Porter Imperial frequently will meet the excess stress without breaking and carry the load over the peak for continued safe operation.

Porter Imperial Red-Strand wire rope is preformed. It is available in Flattened Strand and Round Strand construction and made only with steel cores.

Mack Exhaust Brake

Manufacturer: Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y.

Claims: Mack is producing a new exhaust brake which it says increases engine retardation by more than 50%, which adds to diesel truck safety and reduces brake wear.

By means of a butterfly valve in the exhaust line, back pressure is created to transform the engine to an air compressor, thus augmenting full engine braking which long has been a Mack feature.

An electro-pneumatic control system enables the new exhaust brake to assist the conventional braking system in slowing down or bringing the vehicle to a stop or in retarding speed on downgrades.

The exhaust brake is under the driver's control constantly. A three-position switch permits the exhaust brake to actuate automatically whenever the brakes are applied, to respond when the accelerator is released or to be cut out of action entirely.

An over-riding switch actuated by the fuel injection pump permits the exhaust brake to function only when injection ceases, so that nothing but pure air is trapped by the butterfly valve.

Power to operate the butterfly valve is supplied by an air cylinder connected with the regular air brake system. A magnet valve controls the admission and exhaust of air.

Aluminum Safety Hat

Manufacturer: Davis Emergency Equipment Co., 47 Halleck St., Newark, N. J.

Claims: Davis has added to its line a lightweight safety hat made of aluminum.

The lightness of the metal and its insulating properties make the hat comfortable and cool in hot weather, Davis says. The hat is of ribbed alloyed aluminum construction. It resists impact in excess of 40 foot-pounds.

Indiana . . .

Continued from page 29

but by the end of April 1956, the project was 73.8% complete and 6.8% ahead of schedule.

The busiest construction spot on the toll road when *Excavating Engineer* visited the job in spring of this year was Lake County. The 12 miles of road running through the heart of the south shore industrial district from Hammond to Gary are the most difficult and expensive to build of the entire project. Construction costs here run as high as $10 million a mile. The total cost for this section, most of which is elevated, is $41 million. There are 66 bridges for a better than 5-a-mile clip. Numerous adjustments of rail trackage, pipelines and utilities further complicate the job.

The view for future motorists in this section, however, will be excellent. Via skyline driving, tourists will get a bird's

Toll Road Contractors

Contract No.	Contractor	County	Length	Contract Amount
1-A	Arcole-Midwest Corp. Evanston, Ill.	Lake	0.6	$2,874,387
1, 2	D. W. Winkelman Co., Inc. Syracuse, N. Y. A. L. Dougherty Co. Chicago, Ill.	Lake	4.4	6,762,531
3/4	W. E. O'Neil Construction Co. Chicago, Ill.	Lake	1.0	5,486,858
5	Louis Garavaglia Centerline, Mich. Kenny Construction Co. Skokie, Ill.	Lake	0.75	7,243,088
6	Peter Kiewit Sons' Co. Omaha, Neb. Condon-Cunningham Co. Omaha, Neb.	Lake	2.75	5,209,159
7	Union Building & Construction Corp. Passaic, N. J.	Lake	2.12	3,319,560
8	Union Building & Construction Corp. Passaic, N. J.	Lake	1.9	5,545,643
9	Bates & Rogers Construction Corp. Chicago, Ill.	Lake	2.5	8,222,017
10/10-A	Bates & Rogers Construction Corp. Chicago, Ill.	Lake	2.5	6,086,570
11-A	Dyer Construction Co. Dyer, Ind.	Lake	0.9	895,061
11/12	O'Neil Construction Co. Chicago, Ill.	Lake	2.5	1,642,952
13, 14	Peter Kiewit Sons' Co. Omaha, Neb. Condon-Cunningham Co. Omaha, Neb.	Lake Porter	5.2	3,994,031
15, 16	Traylor Brothers, Inc. Evansville, Ind.	Porter	7.0	5,727,010
17, 18, 19	Winston Brothers Co. Minneapolis, Minn.	Porter La Porte	13.4	7,577,768
20, 21	Traylor Brothers, Inc. Evansville, Ind.	La Porte	6.6	4,063,737
22, 23	Tomlinson Construction Co., Ltd. Toronto, Ont.	La Porte	8.4	3,990,621
24, 25	Rieth-Riley Construction Co. Goshen, Ind.	La Porte St. Joseph	7.4	3,365,528
26, 27	D. R. Smalley & Sons, Inc. Celina, Ohio	St. Joseph	6.9	2,863,320
28/29, 30	Arcole-Midwest Corp. Evanston, Ill.	St. Joseph	6.6	5,252,581
31, 32	Louis Garavaglia Centerline, Mich. Pierson Contracting Co. Saginaw, Mich.	St. Joseph Elkhart	8.7	3,865,953
33/34, 35 36/37	Western Contracting Corp. Sioux City, Iowa	Elkhart	13.9	7,408,867
38, 39, 40/41	Western Contracting Corp. Sioux City, Iowa	Elkhart Lagrange	14.0	6,898,586
42/43, 44/45, 46/47	S. J. Groves & Sons, Co. Minneapolis, Minn.	Lagrange	12.4	6,739,335
48, 49, 50	Union Building & Construction Corp. Passaic, N. J.	Lagrange Steuben	13.1	6,019,594
51, 52, 53	Suber & Co. Whitmire, S. C. Ballenger Paving Co., Greenville, S. C.	Steuben	12.4	7,161,321

Section C 11/12, the easternmost of O'Neil's two jobs, passes through sand dune country. Fine sand hampers maintenance.

eye view of the world's largest steel mill —the Gary Works of United States Steel Corp., Gary; the world's largest cement plant—Universal Atlas Cement Co., also of Gary; and the world's largest oil refinery—Standard Oil Co. of Indiana, located in Whiting.

Contractors in Lake County were building traffic interchanges, hauling embankment material, erecting long concrete and steel structures to elevate the roadway, relocating the Chicago, South Shore & South Bend Railroad, shifting the channel of the Grand Calumet River, and building a long causeway across a shallow lake.

Arcole-Midwest Corp., Evanston, Ill., contractor on section C-1A was building structures and embankment plus a ramp that will connect the toll road with Chicago's projected Calumet Skyway. The Skyway, due for completion in 1958, will be a 7-mile long, $88 million toll facility which will carry traffic from the Indiana road down to 66th and State streets in Chicago. At that point motorists will transfer to Lakeshore Drive and continue on to the downtown Loop via expressway. The connection which Arcole-Midwest was building is part of a $2,874,387 contract.

Next down the line on section C-1/2 was the spread of D. W. Winkelman Co., Inc., Syracuse, N. Y. and A. L. Dougherty Co., Chicago, working on a 4.4-mile $6,762,531 joint contract. The firms were building a mile long causeway down the center of Lake Wolf. To obtain a million yards of fill, the contractors had diked off sections of the shallow lake and pumped them dry so that sand could be taken out of the lake bottom with scrapers. The scouring out of the bed is calculated to increase the recreational value of the lake, which is part of Hammond's municipal park system.

¾-Mile at $7¼ Million

On contract C-5, Louis Garavaglia, Centerline, Mich., and Kenny Construction Co., Skokie, Ill. were building a ¾-mile section of the toll road costing $7,250,340. The story behind this high figure was a bridge 2,500 feet long over the Grand Calumet River. Two other long structures, 2,562 feet and 3,942 feet, were located on C-8 and C-9, respectively. C-8 is a $5,545,643 contract held by Union Building & Construction Corp, Passaic, N. J. C-9 is a Bates & Rogers Construction Corp. contract worth $8,222,017.

East of Gary on section C-13/14, extensive hauling work was going on in mid-March on the spread of the joint venture firm of Peter Kiewit Sons' Co. and Condon-Cunningham, both of Omaha, Neb. This 5.2-mile section in Lake and Porter counties required 2,150,000 cubic yards of borrow material for embankments. The terrain here is gently rolling and pocketed with muck deposits and swamp areas. About 50,000 yards of peat excavation and 65,000 yards of special fill material are called for in the contract.

The joint venturers began work on the $3,994,031 contract in the spring of 1955. During the 1955 work season the firm used two large draglines to speed up loading of sand fill from borrow pits. A new 4½-yd Bucyrus-Erie 71-B and 4-yd. Northwest 95 loaded the sand into bottom-dump Euclids.

Kiewit-Condon-Cunningham also had a $5,209,159 contract for a 2.75-mile section in the city of Hammond. Part of this work on contract C-6 had been subbed out to Missouri Valley Dredging Co., Omaha, Neb. The sub-contractor placed 900,000 yards of hydraulic fill for the roadway during last year's season.

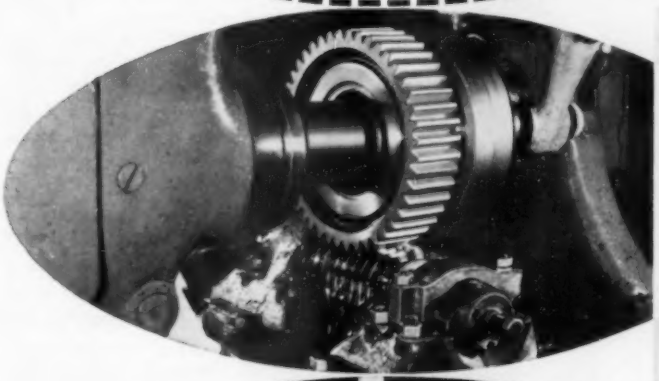
To flood the borrow area, Missouri dug a 1,500-ft. canal to the channel of the nearby Grand Calumet River. A mixture of 20% sand and 80% water was then pumped out and piped to the fill site. About 10,000 cubic yards of material were placed per day by this method. Just before the winter freeze-up, Missouri pumped its borrow pits dry again and turned the borrowing operation over to a pair of Northwest 80-D 2½-yd. draglines and a fleet of Euclid bottom dumps. Another 300,000 yards of fill were placed by this more conventional method.

A typical elevated section of roadway in Lake County was being built by O'Neil Construction Co., Chicago,

Continued on page 66

Important reasons why it pays to use True Original Parts

Allis-Chalmers True Original Parts start right. Each benefits from one of industry's most intensive metallurgical research programs. And each is designed by experienced construction machinery engineers to do a specific job . . . with ample capacity to carry a full share of the work load just as the new equipment part did.



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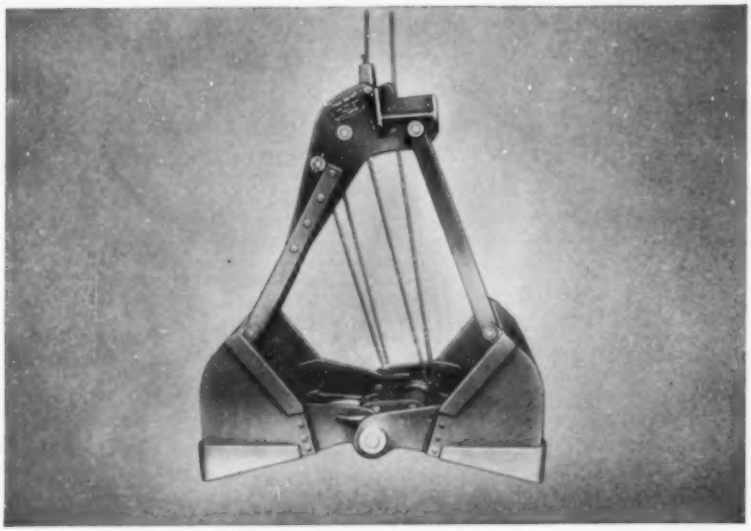

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Indiana . . .

Continued from page 64

which solved its borrow material problem in a most unusual way. The contract called for 837,000 yards of borrow, 5,900 yards of common excavation, 10,680 yards of peat, and 15,000 yards of dry structure excavation and 10,000 yards of wet structure excavation on the mile-long section C-3/4 at the intersection of U. S. Route 41 and Indiana Route 312 in Hammond. Work on the $5,486,858 contract began in April 1955.

Like many contractors in Lake County, the O'Neil section had no borrow material readily available near the right-of-way. The natural terrain in the Hammond area has been considerably modified by filling operations. Large swamp areas have been partially obliterated by disposal and storage of waste materials from nearby industrial plants. Use of dirt fill from good borrow sites several miles away meant a long haul over heavily traveled highways and congested city streets.

To pare off the extra cost of long-distance hauling from the bid price, the O'Neil firm decided to use the only suitable material at hand. A large quantity of blast furnace slag, which is a waste product of steel production, had been dumped during the 1920's on the former site of an Inland Steel Co. mill about a mile northeast of the O'Neil job. This material, if properly placed, could be used for fill.

Slag Tough to Dig

Most other contractors had been skeptical of the practicality of making use of the slag deposits. However, R. O. Wall, heavy construction manager for the O'Neil firm, was confident it could be done. Because the slag had become slightly cemented over a period of years, it proved difficult to dig; and, because the waste metal it contained could not be used for fill, ladle bottoms and melting pots had to be separated and removed. O'Neil overcame both these drawbacks.

To dig the material the firm purchased a Bucyrus-Erie 120-B electric shovel from an iron mining company on the Mesabi range in Minnesota and shipped it to Hammond. The slag bank was first prepared to permit the shovel to load its 6½-yd. dipper fully and quickly. The solidified material was scarified with rippers drawn by Allis-Chalmers HD-21's. Several International

TD-24's, Caterpillar D8's and a new D9 dozer pushed the broken-up chunks of slag into high banks. The 120-B delivered good output by first crowding into solidified material at the base of the banks and then coming up on loose material.

Large metal chunks that had to be removed before compacting the fill were rooted up from the roadway embankment by dozers and returned to the borrow site. A P&H 255 crane equipped with skullcracker and magnet broke up the chunks and sorted out the metal for salvage.

The lightweight slag proved easy to haul and handle. During rain periods it proved easier to compact than sand or dirt fill because rain water drained off quickly.

O'Neil's hauling fleet consisted of four 17-yd. bottom-dump Euclids and four 30-yd. Euclid wagons. Each of the wagons was pulled by means of a special hookup with a tractor from a Caterpillar DW20 motor scraper unit. The unique setup was made possible through special yokes welded on the wagons. Ken Glatt, master mechanic for O'Neil, developed the arrangement. Each Caterpillar-Euclid combination moved about 1,000 yards of slag fill per eight-hour shift on a ¾-mile haul.

Crawlers Spread Fill

The HD-24's, D8's and the D9 crawler units were also used to spread the fill. Compaction equipment units on the job were LeTourneau-Westinghouse tandem rollers and a Ferguson RT-100 rubber tired roller. A 1-ft. layer of sand and a 3-in. compacted stabilizer course of granulated slag were placed on top of the slag fill. Approximately 3,450 square yards of 9-in. concrete pavement and 21,750 square yards of 10-in. pavement were to be laid.

The presence of railroads and highways in the right-of-way required a total of nine structures. The largest of these was the Columbia Avenue crossing (State Route 312) which involved relocations of the Baltimore & Ohio, and the Chicago, South Shore and South Bend lines, and adjustment of gas mains and power transmission lines of the Northern Illinois Public Service Co. The operation was being worked out in stages to permit O'Neil to build embankment, dig footings and place structural concrete without interruption of traffic or utility service.

Structures on the section will take about 18,000 yards of concrete and

SAFETY INSURED—When a 41,300-lb. section of stone crushing equipment was placed by an American 700 Series Crawler Crane, Crosby Clips were used on all wire ropes to assure maximum safety for men and equipment. Genuine drop-forged, hot-dip-galvanized Crosby Clips, with the famous Red-U-Bolt, are specified for safety on more jobs than any other drop-forged wire rope fasteners.

STRONG SAFE, BLOCK

When cofferdam sheetings were about to be drawn from the sucking, grasping soil of the Platte River bottom, a Load-Rated Crosby Crane Block was specified. Made of highest-quality steel, and engineered for safety as well as efficiency, Crosby Blocks are backed by the famous Crosby name—recognized leader in safety. When using Crosby Blocks, workmen can't go wrong, for the safe lifting capacity is embossed right on the side plates.

EASY TAKE-UP

Important design advances by the makers of famous Laughlin Turnbuckles offer added safety and efficiency to users in the construction field. Laughlin Turnbuckle bodies have extra-heavy hex ends which allow fast, easy take-up with a wrench. An exclusive eye design takes the ear of a shackle one size smaller and is stronger than conventional eyes because it conforms more closely to the lines of pull. This design also makes it easier to attach thimbles and other fittings. Exceptionally strong, Laughlin hooks have added heft at points of greatest stress—the ¼-inch hook is actually stronger than most ⅜-inch hooks. Available in a complete range of sizes. A reference chart in Laughlin's free catalog lets you select the proper size turnbuckle for each job.

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A more efficient clevis grab and slip hook made by Laughlin has a "Crimp Style", cotter that can be removed and attached in seconds. Available in a complete range of sizes at distributors everywhere, Laughlin Clevis Grab and Slip Hooks are made of drop-forged steel special forging quality and are heat-treated for maximum strength. For free catalog on the complete Laughlin and Crosby lines, write the Thomas Laughlin Division, Portland, Maine, or the American Hoist & Derrick Co., St. Paul 1, Minnesota.

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says Owner* of DOUBLE-DUTY 20-W Drill

Stepping from its natural task of water well drilling, this Bucyrus-Erie 20-W drilled holes to blast quarry rock for dikeline-ballast work along the lower Missouri River. Swinging a 1,400-lb. tool string, it sank 5-⅝-in. holes from 30- to 95-ft. depths, averaging five feet per hour in bedded limestone, flint and chert. Holes were spaced 21 feet apart and up to 18 feet from the face, some in multiple rows. Excellent toe breakout was obtained without secondary drilling.

Says owner: "We like the 20-W's ability to handle sufficiently heavy tool strings to get real production in this quarry work. Drilling for contractors must be faster than for average water well owners."

You, too, can count on all-steel welded Bucyrus-Erie 20-W and 22-W drills for double-duty — blast holes or water wells. Both have plenty of spooling capacity for the deeper drilling generally required in water well work. For complete information, write today. 65W56

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7,300 tons of steel. The structures are to rest on 32,000 feet of piling. O'Neil used a pair of Bucyrus-Erie 22-B Transit Cranes and a ¾-yd. 22-B crawler crane for concreting work and placing of reinforcing steel. Bucyrus-Erie 38-B's handled piledriving and digging of footings. To provide steam for a McKiernan-Terry 11B3 pilehammer, O'Neil had rigged up a Cleaver-Brooks LFM-12 150-lb. pressure boiler unit. O'Neil also had a pair of hydraulically operated H-3 Hydrocranes for general utility service.

Personnel

Alex B. Zabore is project manager for O'Neil, which had about 200 men employed on two shifts. B. K. Wilson was general foreman for the day crew and Howard S. Rowley for the night shift. Completion date for the job is November 15, 1956. The job is part of design section 1-B. Contracting engineers for this design section were R-M-B Engineers, of Gary. R-M-B is a joint venture of Richardson, Morehouse, Ramsey & Fisher, Pittsburgh, Pa.; Moran, Proctor, Mueser & Rutledge, New York; and Harry A. Balke, Cincinnati, Ohio. J. Paul Ambler is R-M-B project manager.

East of the city of Gary at the intersection of U. S. Route 20 and Indiana Route 51, the O'Neil firm was building another 2.5 miles of the toll road on section C-11/12. Earthmoving work on this $1,642,952 contract was finished except for final grading, during 1955. Paving will be completed this summer.

Located in Indiana's famous sand dune country, the job had plenty of borrow material available. Hauling was most efficient in this area during wet weather because sand made a fairly firm traveling surface. The wet weather of 1955 which slowed down progress of most toll road contractors did not materially affect the O'Neil spread. When other contractors were bogged down in mud, O'Neil's operations were highballing. Excavation quantities for this section were: common, 395,000 yards; peat, 133,500 yards, and borrow, 268,250 yards.

Scrapers Move Fill

Four Gar Wood 25-yd. scrapers and one Cat No. 80 scraper moved the fill material. Working on peat excavation were four Cat DW20 motor scrapers. A 1½-yd. Bucyrus-Erie 38-B dragline cleaned out the peat from pockets as deep as 14 feet. In shallow peat areas the scrapers took out the material directly. On the return trip, the scrapers hauled in sand so that the muck holes were backfilled as the excavation went on.

A crew of 150 men was employed during the 1955 season. Project manager for O'Neil was Andy DeSimon. DeLeuw, Cather & Co., Chicago, was the contracting engineer for design section D-1A where the O'Neil job was located. Rex Rath was project manager.

Uvalde . . .

Continued from page 37

Flo scalping screens and a pair of 5x14 Simplicity screens for sizing.

The No. 2 plant uses a Cedarapids 20 x 20 double-impeller impact breaker, a three-foot Symons shorthead crusher, and two Allis-Chalmers 2-22 Gyrocone crushers. Its screening system consists of an Allis-Chalmers 4 x 10 Ripl Flo, two Symons 4 x 12-foot screens, and two 4 x 10-foot Allis-Chalmers Aero Vibes.

The crushers in these plants are arranged generally in line so that there seldom is any deviation in routing the material through these units. There is much flexibility, however, in input feed and in the screening systems to these plants. The plants are so arranged that they can draw material from either of the stockpiles, from each other and from the surge pile. The removal of fine rock asphalt particles from the surge pile stock prior to storage has been a wise move. Unless these fine particles are taken out, there is a tendency for the surge pile to stiffen up, so that the feed will not cone down properly over the four Jeffrey feeders. This rubble pile feeds well, however, with the finer particles removed. On the storage of the four sizes of aggregate, Jeffrey vibratory feeders are used to keep the material moving evenly.

To fill typical orders for material, a blend of the proper sizes is pulled into each of the two mixing plants, where final blending and sizing is done over the plant screens. In each plant the material then is dropped into a Madsen pugmill, where about 3% of black fluxing oil and 2% moisture is added while the material is being thoroughly mixed. Purpose of the moisture in the mix is to delay the fluxing oil temporarily from setting up the various particles. This moisture is retained until the shipment arrives at its destination. The material is laid by a windrow machine or dump trucks and spread by a motor grader or

mechanical spreader. At that time the moisture slowly evaporates, leaving only the 100% crushed limestone particles impregnated with their natural asphalt and their surface covered by the fluxing material. When a mat of this is rolled down tight and level, it sets up so rapidly throughout its entire thickness that traffic can use it almost immediately.

Railroad Switching Yard

The Missouri-Pacific Railroad currently serves the mine area with a railroad spur and with a switching yard where from 50 to 100 carloads of material can be held in storage. During times of peak demand there always is a problem of obtaining empty cars, but this problem is slowly being worked out. This year promises to be the biggest, businesswise, in the company's history, thanks to an ever-increasing program of building state and county highways and airfields, along with construction of parking areas, driveways and sidewalks in the locality representing the company's market. Because of the material's excellent stockpiling qualities, thousands of tons of it are used for maintenance of highways and streets.

Operations are headed by R. L. White, the company's senior partner. John H. White is the managing partner. His private plane regularly makes the 100-mile trip between the San Antonio home office and the airstrip at the mine. Harald H. Moursund is assistant manager of operations and research. A. G. Zoll is sales manager. T. A. White is purchasing agent and H. W. (Mickey) McCabe is sales engineer.

Operations at the mine are under the general supervision of Sam Lumsden, mine superintendent, with W. R. Reasoner as assistant mine superintendent and D. A. Valentine as plant supervisor. Frank Wingenter is in charge of maintenance and W. A. Bevins is in charge of electrical maintenance.

Dutch . . .

Continued from page 43

of pit A. The clay of pit C was put on top of the sand of pit B.

Restoration operations proceeded so well that in May 1953, summer barley was sowed on about 3,000 acres.

The floods came, took their toll of lives and property, and left. That's when the Dutch took over and began to rebuild.

The Dutch, it seems, are indomitable.

the SAUERMAN METHOD...extends the reach of your crane

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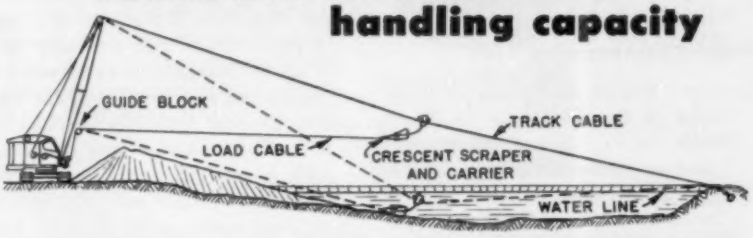

Drawing shows crane using Crescent Scraper and carrier with a track cable. This arrangement increases effective digging range and permits gravity return to the excavation for a faster operating cycle. Maximum operating span is governed only by amount of cable that may be reeved on the drag drum.

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Cleaning Ponds
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Sludge Removal
Cleaning Under Bridges
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Any crane can handle a Crescent Scraper larger than its regular dragline bucket. Smaller units can increase their capacity about 50%. Large cranes can usually double their capacity. When the boom is supported by a strut or outrigger, a Crescent of still greater size can be used. Arrangements of this type have increased rated crane capacity as much as 4 to 1.

The Crescent hauls its load on the ground and the load is automatically deposited when the bucket is raised. Only the empty scraper bucket is lifted by the crane.

When a crane is equipped with a track cable, Crescent and carrier, it can reach farther, dig deeper under water or from soft areas without the nuisance of mats. Anchorage for the track cable may be fixed—or movable to provide easy shifting to a new line of operation. A tractor makes an excellent mobile anchorage.

Although the track cable method is best for increasing your machine's range, the Crescent can also be cast like your regular bucket.

Get the facts on how much the capacity of your crane can be increased. Give us the make, model and boom length. Ask for Field Report 228 and Catalog J. Catalog T tells how to use Crescents with tractors.

This Indiana contractor used the track cable method with a 1½-cu. yd. Crescent Scraper to trench across a river. After the water main was placed, the scraper backfilled the trench.

Boom support enabled this crane to use a larger Crescent. After a sub-grade of coral was placed, the 4-yd. scraper was reversed and used to grade the beach. Barge-mounted winch served as anchorage for track cable and supplied power to scraper on grading operations.

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New Trade Literature

Subject: **Earthmoving Text**

Content: *Modern Techniques of Excavation* is the third book in North Castle Books' illustrated series of works on earthmoving. It is a 608-page abridgement of *Moving the Earth*, by Herbert L. Nichols, Jr., which was published in 1955. Its text follows closely the section of *Moving the Earth* titled "The Work," and describes each type of job the earthmover must do, the problems that arise, and the planning, supervisory and operational techniques used in solving them. Two chapters deal with financial management, estimating, insurance and hints on equipment maintenance. A glossary containing definitions of more than 1,200 terms used in the industry and a 32-page appendix of technical information have been reproduced from the larger book. The author of the book was born in New York City in 1908 and was graduated from Columbia College in 1929. During the periods 1934-1941 and 1945-1955, he operated an excavation and grading business in Greenwich, Conn. Price of the abridged work is $9.

Where to get: North Castle Books, 212 Bedford Rd., Greenwich, Conn.

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Subject: **Cat Electric Sets**

Content: *Cat Electric Sets for Power and Protection* is the title of a new 16-page booklet showing many uses to which Caterpillar power plants can be put, and some of the reasons why they are well suited to the applications. The booklet is well illustrated with pictures of actual installations. Cutaway drawings and photographs are used where needed to show why Cat electric sets are so well received wherever reliable, economical power is required. New Caterpillar generators are also shown in the booklet, and some of the advantages they provide in the way of compactness, ease of operation and maintenance, reliability and power output are discussed. Copies of the booklet are available in English, French, Spanish and Portuguese. Ask for form 31922.

Where to get: Caterpillar Tractor Co., Peoria 8, Ill., or Caterpillar dealer.

Subject: **Rogers Trailers**

Content: A 44-page catalog contains complete information on the Rogers line of heavy-duty trailers. Features, specifications and illustrations of typical uses are provided for each class of trailer. These classes include tilt-deck, gooseneck, girder, and Tagalong trailers. A special section of the catalog illustrates manufacturing procedures at the Rogers plant. Ask for catalog 156.

Where to get: Rogers Brothers Corp., Albion, Pa.

Subject: **Euclid Scrapers**

Content: Euclid Division of General Motors has just published three catalogs describing the overhung engine line of scraper models S-7, S-12 and S-18. Each of the three-color catalogs contain eight pages of cut-a-way views of major components and photographs that help to explain the accessibility and operating features. Condensed specifications are included to provide data on engines, transmissions, tires, scraper controls, weights and dimensions. These also show a performance table showing speeds and grade ability. Illustrations and action views show how hydraulic lever action of apron, bowl and ejector provides fast, independent control of all scraper operations. Catalog 505 covers the S-7 scraper which has a payload capacity of 7 cubic yards struck, 8 yards at 3 to 1 slope, and 9 yards heaped at 1 to 1. The Model S-12, described in Form 506, carries 12 yards struck, 14 yards heaped at 3 to 1 and 16 yards at 1 to 1. The S-18 scraper with Torqmatic drive is described in catalog 507. This model has an 18-yd. capacity struck and rated payload of 21 yards heaped at 3 to 1 and 25 yards at 1 to 1 slope.

Where to get: Euclid Div., General Motors Corp., Cleveland 17, Ohio, or Euclid dealers.

Subject: **Quick-Change Trencher Teeth**

Content: A four page brochure tells how a new set of 60 points can be installed on trenching machines in 30 minutes through use of ESCO trencher teeth and bases. The only tool required to change the trencher teeth is a ball peen hammer; peening is done at only one place at the bases of the tooth. There is no side peening and no interference from adjoining teeth and bases. ESCO trencher teeth will also fit other bases. The teeth are shellcast in Alloy 12 M and forge hardened at the tip for longer wear. Ask for brochure 210.

Where to get: Electric Steel Foundry Co., 2141 N. W. 25th Ave., Portland 10, Ore., or ESCO dealers and branch offices.

Subject: **Single-Stage Pumps**

Content: An eight-page bulletin covering the Ingersoll-Rand re-designed line of DMV-DHV single-stage centrifugal pumps is now available. Designed for general hydraulic services, the pumps feature double mechanical shaft seals which eliminate stuffing box maintenance, and pre-lubricated, sealed ball bearings which require no lubrication throughout their entire service life. Single mechanical seals are also provided for services where the liquid being handled is clean, and supplied at a positive suction pressure. These horizontally-split, single-stage pumps are built in sizes from 3 to 6 inches with heads to 350 feet and capacities from 250 to 2,400 gpm. Ask for form 7248-A.

Where to get: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or branch offices.

Notes from the Manufacturers

Blaw-Knox Co., 300 Sixth Ave., Pittsburgh 22, Pa., has named Richard S. Connolly as assistant sales manager of the heavy steel forms department. Connolly formerly was sales engineer in the department.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed four new excavator distributors. Baton Rouge Equipment Co., Inc., Baton Rouge, La., will handle the firm's full line of ⅜ to 4-yd. convertible excavators and cranes; 15-ton and 25-ton capacity Transit Cranes; and dragline buckets. The territory covered by the firm lies south of and includes the following parishes (counties): Beauregard, Allen, Evangeline, St. Landry, Pointe Coupee, West Feliciana, East Feliciana, St. Helena, Tangipahoa and Washington. Equipment servicing facilities and parts stock will be maintained at the distributor's plant, 425 N. Beck St., P. O. Box 237, Baton Rouge. Schultz Machinery Co., which will serve the entire state of North Dakota, has its headquarters at 1505 Main St., Bismarck, N. D. A branch office is located in Minot, N. D. In addition to the Bucyrus-Erie line described above, Schultz Machinery will carry ⅜-yd. and ½-yd. all hydraulic Hydrocranes. Western Nevada and northeastern California will be the territory for the Tractor Equipment Co., Reno, Nev. The territory includes all Nevada counties except Clark, Elko, White Pine and Eureka; in California, the counties of Alpine and Plumas will be served, along with the eastern portions of Sierra, Nevada, Placer and El Dorado counties and all except the northwest corner of Lassen County. Tractor Equipment's headquarters are at 1525 E. Fourth St., P. O. Box 628, Reno. Road Machinery Co., 716 South Seventh St., Phoenix, Ariz., will serve excavator users in the entire state of Arizona.

"Okay, now, fellows. Let's shake hands and forget the whole incident."

Carboloy Dept., General Electric Co., Detroit 32, Mich., has a new distributor in Kentucky. Big Sandy Electric & Supply Co., Inc., will carry the Carboloy line of standard carbide roof drills, coal augers, universal mining machines and finger bits, as well as special carbide mining tools and masonry drills. Carboloy's Pacific district offices have been moved to new quarters at 2106 W. Washington Blvd., Los Angeles, Calif.

Caterpillar Tractor Co., Peoria, Ill., formally dedicated its new plant at Decatur, Ill., with a week-long open house, beginning May 21. Built to accommodate the company's growing production of wheel-type tractors and motor graders, the new plant is situated on a 425-acre plot of land less than a mile northeast of Decatur. The two main buildings provide more than 840,000 square feet of manufacturing and office space. The manufacturing building has 730,400 square feet. The equipment moves into final assembly on two 800-ft. assembly lines. Three motor grader models—No. 12, No. 112 and No. 212—are assembled on one of the lines. The DW15, DW20 and DW21 wheel-type tractors are assembled on the other line. Ground was broken on the plant site in February 1954. The first motor grader came off the line June 6, 1955; the first wheel tractor was produced on Oct. 21, 1955. Caterpillar has announced some promotions. Lloyd J. Ely, manager of the company's Peoria plant since 1954, was named director of manufacturing for Caterpillar's seven domestic plants. William L. Naumann, manager of the Joliet (Ill.) plant since 1952, was appointed manager of the Peoria plant. Clifford N. Hathway, manager of the employee relations general office, succeeds Naumann as manager of the Joliet plant. E. C. (Chappie) Chapman has been appointed sales manager of the Eastern Division. He formerly was assistant manager of the division. W. E. McCoy, former sales manager of the Eastern Division, has been transferred to the San Francisco office, which is headquarters for the two western divisions. Frank Foster, assistant sales manager of the Southwest Division, was transferred to the Peoria office to assume Chapman's former duties. Ralph Ehni, district representative in the Northwestern Division, was assigned Foster's former duties. G. Geoffrey Deaken was named marketing manager for Caterpillar Tractor Co., Ltd., Caterpillar's British subsidiary. The subsidiary is expanding to include a factory at Glasgow, Scotland, for the manufacture of crawler tractors. Previously, the subsidiary carried on parts procurement and distribution at Desford, Leicester, England. Deaken, 32, formerly was advertising and publicity manager with the Marshall Organization, which includes Fowlers of Leeds. Operations of Caterpillar's Peoria parts department will be transferred early in 1958 to a new building in Morton, Ill. Ground will be broken late this summer on a site of approximately 100 acres. The Morton facility will employ about 1,000 persons. Caterpillar has received an award from the annual

STANDS UP TO SEVERE USE

and even abuse

One word describes a Hayward — *ruggedness.* Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

GLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

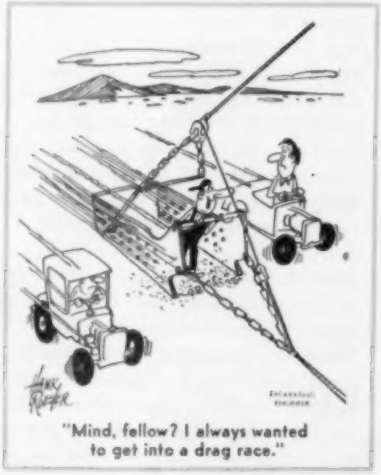
famous for performance since 1880

UP WITH PROFITS
DOWN WITH... EXPENSES!
A more efficient dragline bucket scoops up bigger profits for you. Omaha Dragline Buckets eliminate unnecessary weight making room for a bigger payload. Time and dollar consuming field repairs are reduced. You can't put a better bucket than an 'Omaha' on any job.
Write today for catalog giving specifications for four types available.
OMAHA
DRAGLINE BUCKET
DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

awards committee of the Saturday Review of Literature for "the most distinguished public interest advertisement of the year." The winning advertisement, which appeared last summer in two magazines, was headlined "Ever Watch a Forest Die?" It depicted a weary, smoke-blackened fire fighter resting against a Cat bulldozer blade. Smoke and smoldering embers of a forest fire are seen in the background.

Euclid Div., General Motors Corp., Cleveland 17, Ohio, has appointed the J. H. Ryder Machinery Co., Ltd., 201 Main St. S., Winnipeg, Manitoba, as an authorized dealer for the province of Manitoba. Ryder will handle parts, service and sales for the complete line of Euclid equipment.

International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., has announced the election of John L. McCaffrey as chairman of the board of directors and chief executive officer. McCaffrey had been Harvester president since 1946. Peter V. Moulder, formerly executive vice president, was elected president to succeed McCaffrey. Frank W. Jenks and Harry O. Bercher were named executive vice presidents. Jenks formerly was vice president in charge of merchandising services. Bercher formerly was vice president in charge of the steel division and purchasing and traffic. Christian E. Jarchow will continue to serve as an executive vice president. Among other management changes, Michael F. Peckels was named director of consumer relations and William O. Maxwell was made manager of that department.


"Mind, fellow? I always wanted to get into a drag race."

Leschen Wire Rope Div., H. K. Porter Co., Inc., 2727 Hamilton Ave., St. Louis 12, Mo., has appointed Joseph A. Bell as a district sales representative for the Leschen, Quaker Rubber and Henry Disston divisions. His territory includes North Dakota and northern Minnesota, Wisconsin and Michigan. He formerly was sales and district manager of the Thor Power Tool Co.

LeTourneau-Westinghouse Co., Peoria, Ill., has appointed Jack G. Errion to the position of assistant to the domestic sales manager. Errion, who had been serving as sales promotion manager, will direct the company's sales training program and will assist W. E. Hendricks, domestic sales manager. Kenneth W. Chriswell has been appointed assistant advertising manager.

Mack Trucks, Inc., 350 Fifth Ave., New York, N. Y., has merged several of its wholly-owned subsidiary companies under the parent name, effective June 1. The change was made to provide greater integration of management functions, P. O. Peterson, Mack president, said. Mack affiliates merged under the name of Mack Trucks, Inc., include the Brunswick Ordnance Corp.; Mack Mfg. Corp.; Mack Motor Truck Corp.; Mack Motor Truck Co.; Mack Brothers Motor Car Co.; and International Plainfield Motor Co. Two other Mack subsidiaries, Mack Trucks of Canada, Ltd., and Mack Electronics Div., Inc., will retain their present identities.

Salem Tool Co., Salem, Ohio, has made the following management appointments: J. H. Wilson, Jr., works manager; George Adams, chief engineer; Vincent J. (Vin) McCarthy, sales manager; Kenneth Rogers, office manager; Raymond Lowry, plant superintendent; Donald Thomas, parts manager; and Frank S. Painter, purchasing agent.

Timken Roller Bearing Co., Canton 6, Ohio, has announced the promotion of Wyn McCoy to sales promotion manager of the Industrial Division at Canton. He formerly was district manager of the Chicago territory.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

2400 LIMA DRAGLINES & SHOVELS

2400 Lima Dragline, 120′ Boom 3-6 Yd. Buckets, Hamilton Diesel Engine

2400 Lima Dragline, 110′ Boom 2-6 Yd. Buckets, Hamilton Diesel Engine

2400 Lima High Lift Shovel, 67′ Boom, 50′ Stick, 4 yd. Dipper, Cat D-397 Diesel Engine

Also, Standard 6 yd. Shovel Front Attachment for 2400 Lima and

5½ Standard Shovel Front Attachment for 4500 Manitowoc

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. **GLadstone 5-3658**

Lima 2400 dragline equipped with 110′ boom, two 7-yard Hendrix HS buckets, one 6-yard ESCO bucket, Kohler light plant; machine powered with Caterpillar D-397 diesel engine; 63″ wide treads; long caterpillar frames; machine shipped September 1950; completely overhauled June 1955; engine completely overhauled April 1955; Approximately $5000 in spare parts available; Price, as is where is, $115,000. Box 3677

Page 625 diesel dragline, S/N 242, new in 1951, has 150′ boom and 9 yd. Page bucket; machine in A-1 condition; available now; located near Pittsburgh, Pa. Price $225,000. Box 3697

2400 LIMA—4500 MANITOWOC DRAGLINES

2400 Lima, 110′ Boom, 6 yd.
Price—$80,000

4500 Manitowoc, 120′ Boom, 5 yd.
Price—$82,000

4500 Manitowoc, 120′ Boom, 5 yd., 1½ yrs. old
Price—$132,000

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. **GLadstone 5-3658**

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Page 620 dragline, S/N 165, new in 1943; has 120′ boom and 5 yd. bucket; machine in good working condition, but idle since November 1955; located near Pittsburgh, Pa. Price $50,000. Box 3698

Bucyrus-Erie 200-W diesel dragline shipped in 1950; 125 ft. boom, 6 yd. heavy duty and 7 yd. light weight buckets; some spare parts included; good mechanical condition. Location Melbourne, Australia. Box 3682

Model 2 T Monighan dragline shop number 369, 75′ boom; has practically new Caterpillar D-17000 diesel engine, new circle rails and rollers, swing segment gear, swing pinion and shaft and center pin bushing. Box 3699

4500 MANITOWOC DRAGLINES

All 120′ Booms, 5 Yd. Buckets

1—One Month Old

1—Six Months Old

2—1954 Machines

1—1953 Machine

1—1951 Machine

All powered with Caterpillar D-386 Engines

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. **GLadstone 5-3658**

SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

Bucyrus-Erie 22-B, Caterpillar D318 engine; machine used only part time; absolutely perfect throughout; must see to appreciate; ¾ yd. rock bucket; excellent undercarriage; financing available. Call or write Midland Machinery Co., Chillicothe, Mo. Phone 280.

Bucyrus-Erie 10-B, ¾ yd. shovel, exceptionally clean, machine in good working condition, mounted on Int'l. tandem 6x4; worth $4500—take $2750. McCandless Construction Co., 1625 East Kearney, Springfield, Mo.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

MANITOWOC 2000B—1¼ YD.

Combination Clamshell Crane and Dragline

60′ Boom and 30′ Jib

Powered by Cummins Diesel Engine

In excellent working condition.

Has had good upkeep and care.

Let us show you this machine in operation.

Tel. CYpress 2-4800

H. O. PENN MACHINERY CO., INC.
140 St. & East River **New York 54, N.Y.**

Bucyrus-Erie 15-B backhoe with Buda engine	$ 7500
Insley ½ yd. machine with shovel front, S/N K-3684	4500
Koehring model 205 combination crane, backhoe and shovel, with International diesel engine, S/N C-5082	5000
Rex model 34-E dual drum paver with hydrocycle control, standard water storage tank, distributing boom, controlled door bucket, with 10′ clearance at end of boom and powered by General Motors diesel engine; this machine was new in 1952.	
Allis-Chalmers TS-300 motor scraper with Buda diesel engine	16,000

The above prices are fob Greensboro, N. C.

E. F. CRAVEN COMPANY
Greensboro **North Carolina**

NORTHWEST MODEL 80-D LOADING SHOVEL, S/N 8610; equipped with 3½ cubic yd. Esco coal loading dipper or 2½ yd. standard Esco dipper; powered with Murphy diesel engine and Kohler light plant; machine in good operating condition. Price $24,000 as is, where is at Sunnyhill Coal mine, New Lexington, Ohio. Box 3691

NEW 25 NORTHWEST BACKHOE

Never Used

Price—$22,000

38-B BUCYRUS-ERIE
Shovel or Crane

1½ Yd.—Used 3,640 Hrs.

Price—$42,000

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l Bank Bldg.
Hazleton, Pa. **Gladstone 5-3658**

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

J. P. WAITE, INC.

3304 West Pierce St. **Milwaukee 15, Wis.**

"YOUR USED EQUIPMENT HEADQUARTERS"

NEED ADDITIONAL EQUIPMENT??? . . .
NOT QUITE ENOUGH EXTRA WORK TO WARRANT NEW??? . . .
YET TOO MUCH WORK FOR COSTLY RENTAL??? . . .

Let us show you our complete line of used equipment—

CRANES—SHOVELS—DRAGLINES—BACKHOES

Rubber and crawler mounted

Call EVergreen 4-1900 or stop at Waite yard, 3304 West Pierce St., Milwaukee.

List of Available Equipment

Bucyrus-Erie Model 22-B ¾ yd. Shovel Cat. D-318, very good condition—5 yrs. old

Insley Model "L" ¾ yd. Backhoe Cat. D-315, Ind. Boom Hoist—3 yrs. old

Insley Model "L" ¾ yd. Backhoe, 425 Minn. Moline gas, 30" tracks, 5 yrs. old

Link Belt Speeder Model LS-90 1 yd. Shovel, Waukesha gas, 3 yrs. old—Excellent

Michigan Crane Model T-6-K ⅜ yd. Truck Crane, 25' boom—3 yrs. old

Quickway Model "J" ⅜ yd. Backhoe and Shovel, I.H.C. truck

H-2 Hydrocrane, tagline reel, clamshell bucket, 1947 Chev. truck

Unit Crane, self-powered, 25' boom, ½ yd. cap., Backhoe attachment also—1948

Bucyrus-Erie Model 15-B ½ yd. Backhoe Cat. Diesel, long frame 20" crawlers—4 yrs. old

Bucyrus-Erie Model 10-B ⅜ yd. Backhoe Buda gas engine—1948

Unit Crane Model 517 ½ yd. Also Backhoe Attachment, Clamshell Bucket ½ yd. 1946 w/45' boom

Michigan Model T-6-D ½ yd. Shovel, truck mounted 1941

Quickway Model "E" Crane Boom and Frost Breaker, Oshkosh FWD Truck

International T-D-9 Front End Loader, new tracks and sprockets, 3 yrs. old

Hough Payloader Model H-M 1¾ yd. Cap. 1949-50 Hercules gas, 14:00x24 tires 20-ply

List of Buckets Available

½ yd. Owens Clamshell digging bucket

⅜ yd. Dragline bucket

Hydrocrane H-2 digging clamshell buckets

½ yd. Blaw-Knox clamshell digging bucket

½ yd. Hydrocrane H-3 material handling bucket

Hydrocrane H-3 digging clamshell buckets

OPTIONAL ATTACHMENTS OF YOUR CHOICE AVAILABLE ON ABOVE EQUIPMENT

GOOD BUYS PRICED RIGHT

"CHECK WITH US BEFORE YOU BUY"

All equipment offered subject to prior sale.

MANITOWOC MODEL 3500 STRIPPING SHOVEL, S/N 3602; equipped with 45' boom, 34' sticks and 2 cubic yd. dipper; powered with Caterpillar D-17000 diesel engine new in 1951; machine is in good operating condition. Price $35,000 as is, where is, and can be inspected at Sunnyhill Coal mine near New Lexington, Ohio.
Box 3692

2½ yd. Northwest, single stick, less than year old; dippers, sticks and buckets for Model 6 Northwest, new; Lima ¾ backhoe, 1½ yrs. old, Cat motor, $18,500; 1948 Bucyrus-Erie 38-B crane only, Cat Motor, 65 or 70' boom, counterweight, fairlead, tagline, $20,500; Bucyrus-Erie 38-B shovel, rebuilt GM diesel motor, $21,500; 50' crane boom for 38-B Erie with tagline, counterweight, catwalk, fairlead, has never been on a machine, cost $4100, will sacrifice; 1949 Int'l. TD9 Bucyrus-Erie 1 yd. shoveldozer, new tracks, $5400; Northwest 2½ yd. shovel front only; two 15 yd. LP scrapers; NW25 shovel front for use with crane and attachments; 25' boom for Link Belt crane (top and middle section); 65' boom for NW6 crane with bridle, struts, gantry; backhoe for ¾ Northwest; Peerless 4" deep well pump with 4 cylinder Wisconsin motor, new; 2 drums, 2 niggerhead cargo winches from ships, electric motors, $450 each; manganese dipper fronts for 2 yd. Lorain, 2½ yd. Marion; also fronts and doors for 2 yd. Northwest, 1¼ yd. Link Belt, all new, price 40% off list.

R. E. CUNNIFF
393 Brookline St. **LAsell 7-4300**
Newton Center, Mass.

Bucyrus-Erie 38-B, standard 45' boom, S/N 97955, complete with ropes and 20 T single sheave swivel hook block and 6000# counterweight; practically new. Wire attention: W. J. Brooking

FOOTE MINERAL CO.
18 W. Chelten Avenue, Philadelphia 44, Pa.

MISCELLANEOUS EQUIPMENT

Johnson concrete batching, mixing plant.
Ready-mix concrete plants, complete (2).
S/L derricks, steel, 10, 20, 35, 75 tons.
Locomotives, diesel, gas 15 to 100 tons.
Shovels, cranes, dragls., 1½ to 18 yds.
Placer gold dredges; tugboat, 69', steel.
Euclid trucks, 15-22 ton rear dump.
Colby hammerhead crane, 300', 14-ton.
Monighan walker dragls., 9, 6, 5W, 200W.

H. Y. SMITH COMPANY
828 N. Broadway **Milwaukee 2, Wis.**

Bucyrus-Erie 37-B shovel front, complete with boom, sticks, 1½-yd. bucket; surplus, guaranteed like new condition; a bargain at $2850 at our yard. Wenzel Machinery Rental & Sales Co., 565-7 South 10th St., Kansas City 5, Mo.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

MISCELLANEOUS EQUIPMENT

OFFERED FOR LESS THAN HALF-PRICE

One Ruston-Bucyrus 42-RT Electric Blast Hole Drill.

One Bucyrus-Erie No. 12 Electric Bit Dresser.

This equipment is in excellent condition. The first machine has worked only 200 hours; the second is new.

Carrieres de Porphyre de Quenast
35, Rue du Faubourg, 35
QUENAST-BELGIUM

1—Ingersoll-Rand, gasoline engine operated, Quarrymaster drill, model QM-2 equipped with 500 cu. ft. compressors; UL-83 regulators; 40' drill steel change; S/N 11697. Included are three 40' drill rods, 3¾" O.D.—¾" wall, 2" x 3" A.P.I. threads for 6" bits; excellent condition. Priced as is near Pottsville, Pa. $25,000.
Box 3695

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 van runner; spare liners. Box 3696

EQUIPMENT WANTED

New or used backhoe attachment to fit Bucyrus-Erie model GA3 excavator, S/N 11446. Address reply att'n J. W. Perkins.

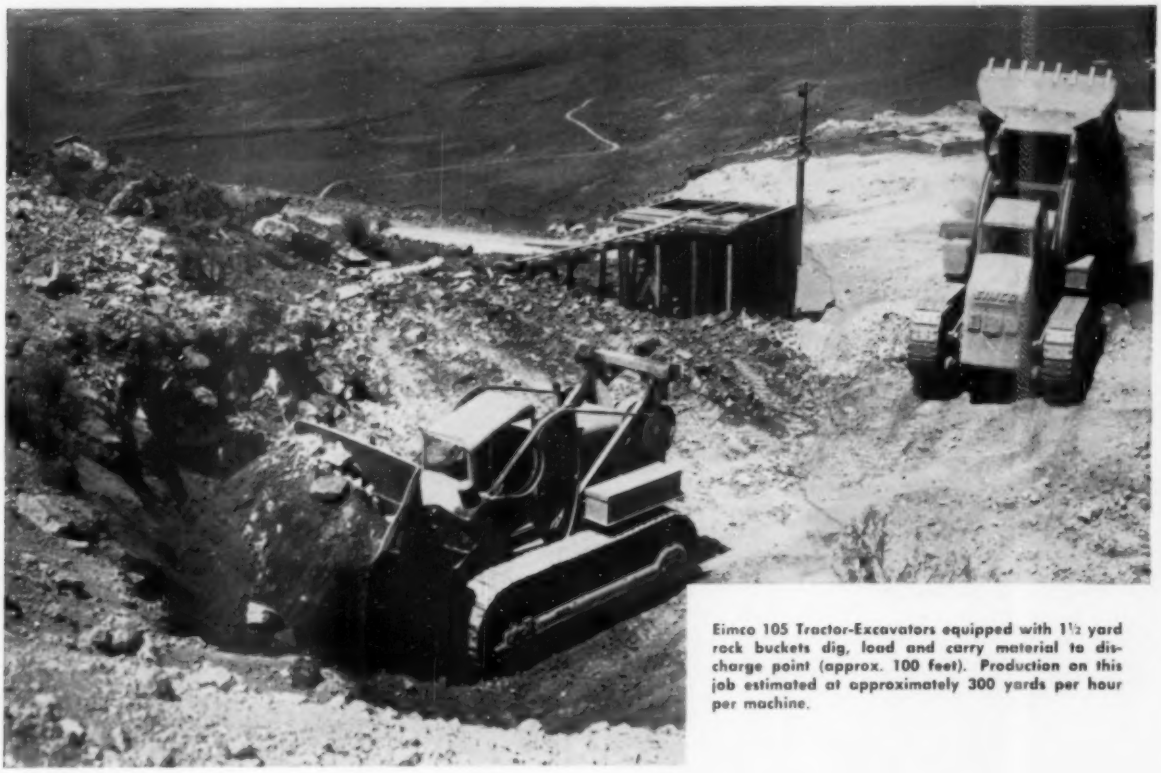
WM. H. ZIEGLER CO., INC.
2929 University Ave., S.E.
Minneapolis 14, Minnesota

HELP WANTED

EXPERIENCED EXCAVATOR SERVICEMAN FOR CANADA

Prominent excavator manufacturer has position available for capable man, experienced in shovel and dragline operation and maintenance. A knowledge of mining, quarrying, and construction methods would be helpful. Trouble shooting and educating distributors' personnel with parts and service problems very important. Considerable traveling involved. Salary dependent upon experience. State full particulars. All replies confidential.
Box 3693

If you are Buying or Selling Used Equipment, this is the place to let the Excavating Industry know about it.



Eimco 105 Tractor-Excavators equipped with 1½ yard rock buckets dig, load and carry material to discharge point (approx. 100 feet). Production on this job estimated at approximately 300 yards per hour per machine.

SPEED, VERSATILITY AND DEPENDABILITY WITH EIMCO 105 TRACTOR-EXCAVATORS

Eimco 105 Tractor - Excavators, shown above, dig and load more rock at less cost per yard than any other earthmoving machine.

These Eimco Excavators are multi-purpose machines. They are easily and quickly moved from one spot to another where work is needed. They are used as prime movers, on production excavation and loading jobs, for bulldozing and other work around the plant.

In production work, the Eimco 105 Tractor-Excavator will load in rock at the rate of 5-6 yards per minute and in easier materials such as sand and gravel, the 105 will load as much as 8-9 yards per minute.

Eimco 105's do a better job than the conventional tractor mounted machine because of Eimco's exclusive operating features. Independent track operation increases the effectiveness of the machine in speed of maneuverability, saves travel time and wear and tear on track assemblies, chains and all crawler parts.

The Eimco power shift saves wear and tear on operators, keeps them fresh and alert all day long. Operator position up front makes it possible to see what is being done.

All cast-alloy steel parts are standard equipment on Eimcos at no extra cost. Torque converters, also standard, provide better engine operating flexibility and protect the engine from shock.

Eimco 105's are different in construction, design and operation. They are the only really modern tractors in production today. An Eimco engineer will be glad to tell you about the 105 and answer your questions. When you need a Tractor or Tractor-Excavator be sure to see an Eimco 105 at work, and talk to people using them. You are invited to compare the Eimco 105 Tractor, piece for piece with the tractor you are using or any other tractor.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San-Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B. C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-207

(PLEASE GIVE THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN)

Stray Currents from THUNDERSTORMS don't worry me now

I'm using Primacord

"You understand . . . I don't *like* thunderstorms. No blaster does. But ever since that job in Kentucky when a direct hit failed to detonate Primacord, I make it a point to use this detonating fuse during the thunderstorm season."

Here's the reason. Primacord is an insensitive detonating fuse. It is not affected by stray electrical currents. It cannot be set off by friction, sparks or ordinary shock. It must be detonated with a blasting cap.

Primacord is used to detonate the entire load in each hole, and to connect all holes in planned sequence to produce *good digging.* A detonating cap is attached to the Primacord only after everything is ready . . . when men and machines are out of the danger zone.

Use Primacord wherever there is danger of stray electrical currents — and particularly during thunderstorm seasons.

For more information see your Explosives Supplier, or write to

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut

Primacord — Quarrycord — Ignitacord® Safety Fuse — Blasting Accessories
Established 1836

To connect a Branch Line of Plastic Reinforced or Plastic Wire Countered Primacord with the Trunk Line

use this DOUBLE HITCH in the textile-covered Primacord Trunk Line. *Draw it up as tight as you can, and make sure that the Branch Line leads off at a RIGHT ANGLE to the Trunk Line.*

PRIMACORD®

DETONATING FUSE

PROVED AND APPROVED

P-21

Cut the Primacord off the Spool Immediately

Make this a safety *habit!* As soon as you have taken off the length of Primacord you need for a down-hole or for a trunk-line, *cut it off the spool! Don't waste a second — do it now!*

To connect the Detonator with the Primacord Trunk Line

use FRICTION TAPE. You can detonate Primacord with fuse and cap or electric blasting cap. Lay the cap alongside of the Primacord with the business end of the cap pointing in the direction that the Primacord will detonate. Tape the two snugly together, so that you have a tight connection.

To connect a Branch Line with the Trunk Line

Use this HALF HITCH for Plain and Reinforced Primacord. *Draw it up as tight as you can, and be sure the Branch Line leads off at a RIGHT ANGLE to the Trunk Line.*

To lengthen a Trunk Line

of Plain or Reinforced Primacord, tie a SQUARE KNOT. *Draw it up as tight as you can* — it won't slip back. Caution: don't use any knot in a hole — it might break or hang up explosives when loading.